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U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY.—BULLETIN No. 27.

A. D. MELVIN, CHIEF OF BUREAU.

INFORMATION

CONCERNING

THE ANGORA GOAT.

BY

GEORGE FAYETTE THOMPSON, M. S.,

Editor, Bureau of Animal Industry.

Revised, 1906, by

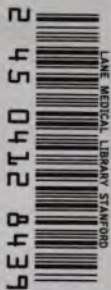
SALLIE RUSSELL REEVES,

Editorial Office, Bureau of Animal Industry.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.

1906.





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GRAND CHAMPION BUCK AND DOE AT THE PORTLAND EXPOSITION, 1905.

Note the character of the buck shown in the head, boldness of carriage, and the general pose. The length of fleece is particularly noteworthy. The feminine character of the doe may be noticed in the neat, expressive head. Both of these goats were bred in South Africa.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Washington, D. C., July 27, 1906.

SIR: I have the honor to transmit herewith the manuscript of a revised edition of Bulletin No. 27 of this Bureau, "Information Concerning the Angora Goat." This revision has been made in accordance with the following joint resolution of Congress which received the approval of the President on March 3, 1905:

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there be printed three thousand copies of Bulletin numbered Twenty-seven of the Bureau of Animal Industry, entitled "Information Concerning the Angora Goat," the same to be first revised under the supervision of the Secretary of Agriculture, one thousand copies for the use of the House of Representatives, five hundred for the use of the Senate, and one thousand five hundred for the use of the Department of Agriculture.

The original bulletin, issued in 1901, was written by Mr. George Fayette Thompson, editor of this Bureau, who died suddenly just as he was about to undertake the revision. I take this occasion to bear testimony to Mr. Thompson's exceptionally valuable services to the Angora goat industry. He was a recognized authority on Angora goats, as is evidenced by the fact that he served as judge at a number of the large live-stock shows, including that of the Louisiana Purchase Exposition in 1904.

The work of revision has been done by Mrs. Sallie Russell Reeves, who for several years assisted Mr. Thompson in his work concerning Angora goats, and thus enjoyed special opportunities for becoming familiar with the subject. A great deal of the original text was rendered obsolete by the rapid development of the industry, having to be omitted or entirely rewritten; considerable new material has been added, and the statistical matter has been entirely revised. The endeavor has been made to bring the bulletin down to date in every respect, and the revision has been done conscientiously and creditably. The manuscript has been examined and approved by Mr. George M. Rommel, the Animal Husbandman of this Bureau, and by Mr. John W. Fulton, secretary of the American Angora Goat Breeders' Association.

Respectfully,

A. D. MELVIN,
Chief of Bureau.

HON. JAMES WILSON,
Secretary of Agriculture.

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INFORMATION CONCERNING THE ANGORA GOAT.

PRELIMINARY REMARKS.

The goat has accompanied civilization into all parts of our country—not numerously, but persistently. He is everywhere, and is well known. There are very few people who have not seen a goat, and there are fewer still, no doubt, who have seen many goats. The comic writers, playing upon his peculiar habits, have brought him into disrepute, although these habits, to a large extent, are such as are recommending him for special favor at this time. His fame was as a denizen of vacant lots and back alleys, subsisting upon anything or nothing, and a foe to everything. So far as the general public was concerned, he was not reckoned with as a useful animal and was tolerated only as a pet for children.

During more recent years a great interest has been awakened in the goat, and it now seems that he is about to receive the consideration that is due him. One of the causes contributing to this awakening was an article in the Yearbook of this Department for 1898, entitled "Keeping goats for profit," by Capt. Almont Barnes, of the Division of Statistics of this Department. The information which this article contained was widely disseminated. The Yearbook was distributed to the extent of half a million copies, and, besides, in order to meet the growing demand, the article was reprinted separately and mailed to many thousands of inquirers at the Department for information on the subject of goats; and not alone the agricultural papers, but the daily press as well, took up the matter and exploited the good points of the goat industry. The article set forth, among other things, the great value of the goatskins which we import annually, and how we ourselves might easily produce them; the usefulness of the carcass for food, especially of the Angora breed; the exceedingly small expense involved in raising the animal, owing to his habits of feeding upon that vegetation which is in greatest abundance and which other ruminants refuse; the millions of acres of land in the United States that might be made available for goat raising which otherwise would remain, as heretofore, unemployed.

The result of this wide distribution soon developed the fact that the goat was present in the United States in larger numbers than was

supposed. Although until recently very little had been said or written about Angora goats during the last forty years, they had been extensively bred in the Western States and Territories, especially in Texas, New Mexico, Nevada, Florida, California, and Oregon. In a general sense, all those animals which are a cross in any degree of the Angora goat have been considered as Angoras, for the Angora and the common goat readily cross, and the latter frequently becomes the foundation stock of a good flock of fleece-bearing animals.

It is the purpose of this bulletin to deal with the Angora goat only, and the effort is made to answer such questions as have been received by the Bureau from all parts of the country. These answers are based upon the experiences of those persons who have raised Angora goats, some of these breeders having been in the business forty years and more. Differences of opinion are found to exist on several important points, where each contestant appears to occupy plausible premises; but this is not at all strange when the history of the Angora goat is considered, for it is not certain that all of the animals imported as purebreds were pure; indeed, it is held by some of our leading breeders that there is no longer in Turkey or elsewhere any such thing as a purebred Angora goat. Besides, there has been no general register for Angora stock in the United States until recently, and each breeder has been at liberty to judge points for himself. If a general Angora register had been established thirty or forty years ago, the industry would now be conducted upon more definite lines, and most of the questions now arising as to points in breeding would have been settled. In this connection it should be stated that C. P. Bailey & Sons Company, of California, have kept a private register of their goats since 1867, but there appears to be no other similar record.

All live-stock industries have their drawbacks, and the Angora goat industry is no exception. The greatest injury that it has suffered is from the misinformation which has been published about it. This misinformation is calculated to be favorable, but the features are overstated. Time and again the press has reiterated the statement that Angoras live on nothing, have no diseases, and shear perhaps 10 pounds of mohair, worth about 55 cents per pound. While the goat prefers to live on that which is refused by most other animals, it seems preposterous that it should be able to subsist on practically no feed but what it can pick up.

There has been a steady and healthy demand for good animals during the last few years, and this demand has come very largely from men whose judgment is that the business is upon a solid foundation. A poor goat is a poor investment, while a good one is a money maker. The proof of this assertion is in the prices obtained for the mohair. Only a few years ago American mohair was about the poorest on the market, but to-day much of our product tops the world's market. It

may be stated here that goats taken from the Southwest to the cooler Northern States produce heavier and finer fleeces after a few generations.

Some sheepmen have feared that the goat will spoil the range or pasture, or will tend to supplant sheep. On the contrary, the evidence is that in many localities goats will themselves convert the most undesirable brush land into fine sheep pastures. Wherever grass is indigenous to a soil, it will come up after goats have removed the brushwood and weeds. Mohair will displace very little wool, as it does not contribute the warmth that wool gives, and this warmth in clothing is something indispensable. Besides, the question of competition can not be raised so long as our sheepmen fail to supply the demands of the country to the extent of \$47,000,000, which was the value of wool imported into this country during the calendar year 1905.

As there is an almost prohibitory duty of \$500 on each goat exported from South Africa, and a prohibitory decree forbidding exportations of Angoras from Turkey, it is very probable that there will not be many additional importations of the animals from those countries in the near future, unless the laws in this respect are modified.

The quality of the goats in this country has improved wonderfully during the last few years, and with the infusion of the Turkish and South African blood now possible on account of recent importations, together with intelligent breeding, there seems to be no reason why the animals in the United States should not prove the equal of any in Turkey or South Africa.

ORIGIN AND HISTORY.

The purpose of this paper is to give prominence to those phases of the Angora goat industry that are of practical importance; therefore a brief space only will be devoted to the history of the breed.

Naturalists generally agree that there are about ten species of wild goats, all confined to Europe and the Himalayas of Asia. These are divided into two groups, as follows:

I. *The ibexes*.—These, according to Hayes, have, as a distinctive characteristic, horns "flat in front, with a horizontal triangular section, furnished with large transversal knots."

II. *Goats proper*.—These, according to Hayes, have horns "compressed and carinated in front," and, according to Wood, "may be distinguished from the ibex and the sheep by the peculiar formation of the horns, which are compressed and rounded behind and furnished with a well-developed keel in front."

The second group is subdivided into two subspecies—*Capra falconeri* and *Capra zegagrus*. The latter is also known as the Paseng, the Bezoar goat, or wild goat of Persia, and is generally accepted as the

goat from which the Angora is descended through *Capra hircus*, which is claimed to be the origin of all the common breeds of goats.

As to the parent of the Angora stock, there is a difference of opinion between the two best-known writers on the subject—John L. Hayes, author of "The Angora Goat," etc. (1882), and S. C. Cronwright Schreiner, author of "The Angora Goat" (1898). The one takes the position that the Angora is descended from *Capra falconeri*, the other from *Capra xagrus*. Owing to the additional information which has been obtained since the appearance of Hayes's book and which is embodied in Schreiner's work, there can hardly remain a doubt of the correctness of the contention that the Angora goat descended from *Capra xagrus*.

Schreiner, who has made extensive research, has described these two subspecies as follows:

Capra falconeri has a beard which extends from the chin to the shoulders and chest, and long spirally twisted horns, the twist being outward from the base. The males, when old become whitish all over. The ewes have a beard confined to the chin, and small horns with a slight spiral twist. It is a native of the western Himalayas, northern Afghanistan, and possibly of Persia; it is also found generally in Cashmere and on the Tibetan side of the Himalayas. Fossil remains show that it is one of the oldest types of goats.

Capra xagrus^a is chiefly remarkable for its enormous horns, which are larger proportionally than in any other ruminant animal; they approximate the triangular in form, transversely rigid, and are bent backward as in the domestic varieties, being scimitarlike in shape of curve, and having no spiral twist. Large horns of *Capra xagrus* measure 40 inches along the curve, but a length of upward of 52½ inches, with a basal girth of 7 inches, has been recorded. It stands somewhat higher than any of the domesticated varieties of the goat (an adult male stood 37 inches at the withers), from which it further differs in its short and powerful neck, its stouter limbs, and slender body. In the female the horns are exceedingly diminutive or are altogether wanting. The fur, which over the greater part of the body is short, is of a grayish-brown color, with a black line running along the entire length of the back, while the under surface of the neck and the beard, which is present in both sexes, are of a brown color. In the winter coat the hair on the neck and shoulders is rather longer than elsewhere, and in the same season, in the colder part of the animal's habitat, a coat of woolly fur is developed beneath the hair.

The Angora breed of goats originated in the vilayet of Angora, in Asia Minor, but it is not known when this was. Some have ventured to say that it was 2,400 years ago. There is pretty strong evidence which goes to show that they were a distinctive breed when Moses was leading the Israelites out of Egypt. Goats' hair was spun by the

^a There is evidence that in classic times this goat was widely distributed over the Grecian Archipelago, although in Europe it is now found only in Crete, the island of Antemelo, in the Cyclades, and perhaps also in Guire to the northeast of Eubœa. Eastward it is found in the hills and mountains of Asia Minor, being especially common in the Taurus Range, and it extends thence through Persia into Baluchistan, Sind, and Afghanistan. In India its range does not extend beyond the western side of Sind. It is found in Sind and Baluchistan in hills a little above the sea level; in the mountains of Persia it ascends to an elevation of 11,000 feet to 12,000 feet.—Schreiner.

Israelites for curtains and other purposes for use in the temple.^a The story recorded in I Samuel (chapter 19) of the artifice of Michal in deceiving the messengers of Saul by placing an image in the bed in place of David and giving it a pillow of goats' hair, is believed by Pen-nant to refer to a pillow made of the Angora fleece.

The city Angora, or Enguri, the capital city of the vilayet of Angora, is the ancient Ancyra, and is located about 220 miles south by south-east from Constantinople. Angora was the seat of one of the earliest Christian churches, which was probably established by the Apostle Paul. The province is mountainous to a considerable extent and furrowed by deep valleys. It is about 2,900 feet above the level of the sea. Of the climate Mr. H. A. Cumberbatch, British consul at Angora (1895), quoted by Schreiner, says:

The climate is extreme. In the months of January and February the thermometer will mark a minimum of 10° F. for several days at a time, reach as far as 0° F., whilst in June and July the maximum readings of 85° F. are maintained day after day, with little or no rain. The country is covered with snow in the winter, rain and snow falling frequently. In 1894 the total rainfall at Angora was 8.12 inches, but that was an exceptionally dry season. For the first six months of 1895 the rainfall was 10.10 inches, which is somewhat above the average; the heaviest rainfall in twenty-four hours having been 1.20 inches.

It was here that this famous goat reached its perfection. That the altitude, the soil, or the climate, or all of them together had much influence in producing this fleece-bearing goat is supported by strong evidence. Dr. John Bachman and the *Encyclopædia Britannica* both state that the fineness of the hair of the Angora goat may perhaps be ascribed to some peculiarity in the atmosphere, "for it is remarkable that the cats, dogs, sheep, and other animals of the country are to a certain extent affected in the same way as the goats." The same opinion was expressed by Captain Conolly, quoted by Southey (1848): "It is remarkable that wherever these goats exist the cats and greyhounds have long silky hair also—the cats all over their bodies, the greyhounds chiefly on their ears and tails." These statements led Schreiner to the conclusion that the atmosphere is the chief factor. He says: "At any rate, there seems to be no doubt that a limited and comparatively well-defined region around the town of Angora

^a Take ye from among you an offering unto the Lord: whosoever is of a willing heart, let him bring it, an offering of the Lord; gold, and silver, and brass, and blue, and purple, and scarlet, and fine linen, and goats' hair.—Exodus xxxv, 5, 6.

And every man, with whom was found blue, and purple, and scarlet, and fine linen, and goats' hair, and red skins of rams, and badgers' skins, brought them.—Exodus xxxv, 23.

And all the women whose heart stirred them up in wisdom spun goats' hair.—Exodus xxxv, 26.

And he made curtains of goats' hair for the tent over the tabernacle: eleven curtains he made them. The length of one curtain was thirty cubits, and four cubits was the breadth of one curtain: the eleven curtains were of one size.—Exodus xxxvi, 14, 15.

possesses in a degree unapproached elsewhere in Asia Minor, and probably in the world, those conditions favorable to the development of the soft, silky, lustrous white mohair goat."

Although this atmospheric effect on the quality of hair is generally accepted, the feed of the animals also has a telling influence, and the experience of Angora breeders shows that with good feed and with animals whose blood is adulterated as little as possible with native blood, a fleece equal to any produced in Turkey may be obtained.

Mr. Henry O. Binns, who had about twenty years of experience with these goats in the vilayet of Angora, says the pure animals were about bred out in 1863. The reason for this was the extensive crossing with the common Kurd goat, to which reference will be made. As early as 1839 there ceased to be a demand for the spun yarn of Asia Minor, owing to the fact that Europe could spin the yarn at much less cost; but there was a European demand for the raw hair which exceeded the supply. This condition of things led to complications and a mixture of breeds from which the mohair world has not yet recovered. There can hardly remain a doubt, however, that, with the recent renewed interest in the industry and with the intelligence that the breeders will bring to bear, the Angora goat industry will soon be placed on the highest plane.

HISTORY IN THE UNITED STATES.

The history of the Angora goat in the United States has been marred by the carelessness or indifference of occasional writers for the press, who have been often inaccurate as to dates or facts, and also by others whose interests have doubtless led them into exaggerations. The real facts of its history in the United States, however, are so few and so simple as to prompt that venerable breeder, William M. Landrum, to say that they would make but a very small book.

THE DAVIS IMPORTATION.

During the Administration of President Polk the Sultan of Turkey requested him to recommend some one to experiment in the culture of cotton in Turkey. Accordingly, Dr. James B. Davis, of Columbia, S. C., was recommended and he received the appointment.

Upon the return of Doctor Davis to this country in 1849 he brought with him 9 very choice goats—7 does and 2 bucks. These animals were imported as Cashmeres and were so regarded until after they had passed into the hands of Col. Richard Peters.

At the present time it is everywhere acknowledged that the goats imported by Doctor Davis were Angoras, but at the time they were imported nearly everyone else who pretended to know anything about goats agreed with Doctor Davis in believing that his goats were Cashmeres.

The following account of how Doctor Davis obtained these animals was furnished to the Bureau by his daughter, Mrs. Harriet Davis White:

Doctor Davis, hearing from Bishop Southgate of these silken-fleeced goats, realized their value and the importance of introducing them into his own country. He sent a trusty messenger to a native friend of Bishop Southgate, to whom a letter was written explaining the wish of Doctor Davis to obtain Cashmere goats of the purest blood; and, being familiar with the country and with the breed of goats that was desired, he purchased for Doctor Davis 10 pure-blood Cashmeres and one pair of Tibet shawl goats. Whether these were the genuine Cashmere, as Doctor Davis believed, or not, there has certainly never been any importation of goats made subsequent to this one that has equaled the ones purchased by this native Persian for Doctor Davis, and by him imported into the United States. The messenger sent by Doctor Davis was absent for several months, and the Doctor thought the effort to purchase the goats was a failure. Finally the messenger returned. The goats were brought to the model farm furnished to Doctor Davis by the Sultan of Turkey for experimenting in the raising of cotton. The 10 Cashmere goats lived, but one of the Tibet goats died, and only the ewe was brought to the United States. The goats were brought down from the mountains to the farm of Doctor Davis near San Stefano on camels driven by the usual camel drivers.

The goats were kept on this farm until Doctor Davis was ready to leave Turkey. They were shipped to England and exhibited there and also in Paris, where they attracted much attention.

Mrs. White states that there were 10 goats in this importation. Col. Richard Peters says 9, Col. William L. Black, author of "A New Industry" (Angora goat), says there were 9, but 2 were kids, and Schreiner in "The Angora Goat" says 9. Mrs. White also asserts that the fleece of these goats brought \$8.50 per pound and was sent to New York, where it was bought, and then shipped to Paisley to be used in the manufacture of the Paisley shawls.

Col. Richard Peters, writing in 1876, says of these animals:

These doubtless were selected from the herds of Angora, a district of country lying among the Taurus Mountains, which traverse Asiatic Turkey, and which derives its name from its principal city, situated about 200 miles east of Constantinople.

Besides these, according to Colonel Peters, there came in the same lot one purebred Tibet doe, several head of crosses between the Angora and Tibet goats, and quite a number of grade does bred from the common short-haired ewes of the country and his Angora bucks.

Plate 1 shows a pair of the Angoras imported by Doctor Davis. The first is a buck, weighing 155 pounds and carrying a fleece of 7 pounds; the second is a doe, weighing 102 pounds, carrying a fleece of 4½ pounds. These pictures appeared in the Country Gentleman in 1856 and were furnished that paper by Col. Richard Peters, who was at that time the owner of the goats.

Doctor Davis, not being familiar with goats, thought these were the famous Cashmere goats which furnished the fiber for the costly Cashmere shawl, and they were called Cashmere goats for many years after their introduction into the United States. The records show that as late as 1861 Mr. William M. Landrum, the veteran breeder of Angoras,

was awarded a silver goblet and \$25 in cash for the introduction of the first Cashmeres [Angoras] into California. Hon. Israel S. Diehl, writing on "The Goat" in the Annual Report of this Department for 1863, gives descriptions of different varieties of Angoras in Asia Minor, among which was one variety which might very easily be mistaken for the Cashmere. He says:

There is also a second or other variety of Angora, or shawl, goat besides those generally described. This goat has an unchanging outer cover of long, coarse hair, between the roots of which comes in winter an undercoat of downy wool that is naturally thrown off in spring or is carefully combed out for use. A remarkably fine species of this breed exists throughout the area to which the white-haired goat is limited, and similar breeds prevail all over the highlands of Turkish and Persian Armenia, Koordistan, and at Kirman; and, although some flocks yield finer fleeces than others, it is called the same wool or underdown as the wool of Cashmere and Tibet, and samples of the wool of the Tibetan and the double-wooled goat of the banks of the Euxine show them to be but varieties of the same species.

This goat is of a larger size than those of the more southern Turkish provinces and its wool finer, and is the variety probably introduced by Doctor Davis from Asia Minor as the Cashmere, and now erroneously so called throughout the country, as all the importations of this country, as far as we can learn, were shipped from ports on the Mediterranean or Constantinople, several thousand miles from Cashmere or Tibet, through inhospitable and almost untraveled countries for Europeans, which goes far to prove the so-called "Cashmere" goat to be the Angora.

Mr. Diehl in the same article describes the Cashmere goat. The difference between it and the Angora of our country will be seen to be distinct. The similarity of the variety of Angora described above and the Cashmere is marked, especially in respect of the downy undercoat. His description of the Cashmere is as follows:

This variety of the wool-bearing or shawl goat, as it is often called, is spread over Tibet, northern India, and the regions to the east of the Caspian Sea. It is somewhat smaller than the common and Angora goat. It has straight, round, pointed horns, pendent ears; is covered with straight and falling long, fine, flat, silky hair, with an undercoat in winter of a delicate greenish wool, of but 2 to 3 ounces each, which latter alone constitutes the fabric from which the celebrated shawls are made. Ten goats furnish only enough for a shawl 1½ yards square; but this is often found differing both in color and the quality of the wool, or rather the fine hair, of which the fleece is composed. The principal points in the most approved breeds are large ears, the limbs slender and cleanly formed, the horns not spirally twisted, and, above all, the fleece being long, straight, fleecy, and white.

This soft undercoat of the Cashmere is known as "pashm," and is the product from which the famous Cashmere shawl was made.

Col. J. Washington Watts, a goat breeder and personal friend of Doctor Davis, wrote to the Bureau concerning the Davis importation as follows:

Col. Richard Peters was an intelligent breeder and had his doubts as to the correctness of this name (Cashmere). He asked the Southern Central Agricultural Association of Georgia to appoint a committee to investigate this matter. The late Doctor Bachman, a distinguished naturalist of Charleston, S. C., then on a visit, was named chairman of this committee. In his report he said that these goats were neither Cashmere nor Angora, but a better animal than either. Other evidence came in that satisfied Colonel Peters that they were Angoras.



FIG. 1.—ANGORA BUCK. (DAVIS IMPORTATION, 1849.)



FIG. 2.—ANGORA DOE. (DAVIS IMPORTATION, 1849.)

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Colonel Watts roomed with Colonel Peters during the State Fair in Augusta about 1853 or 1854, and was present when the sale of these goats was made to Colonel Peters.

"A few years after this," Watts writes, "I obtained a pair of the Davis goats from Colonel Peters's herd. The fleeces of the bucks weighed from 6 to 7 pounds, of the ewes about 3 pounds, and in New York and Baltimore brought about 50 cents a pound."

INTEREST AROUSED BY THE DAVIS IMPORTATION.

The first (or Davis) importation of Angoras was frequently exhibited at fairs, and attracted much attention. The reports made by the officials of fair associations were always favorable, sometimes flattering, and, as is known after years of experience, not always correct. The United States Agricultural Society, which held an exhibition in Philadelphia in 1856, awarded to Col. Richard Peters, who was then the owner of the Davis goats, \$100 as a special reward. The following report was made upon the animals:

They have become known as Cashmere goats from the pure white color and fineness of their fleeces, and their undoubted Eastern origin. The fleeces from the bucks weigh from 6 to 7 pounds, those from the ewes from 3 to 4 pounds. The flesh of the crosses is superior to most mutton, tender and delicious, making them a desirable acquisition to our food-producing animals.

The ease with which they are kept, living as they do on weeds, briars, browse, and other coarse herbage, fits them for many portions of our country where sheep can not be sustained to advantage, while their ability and disposition to defend themselves against dogs evidence a value peculiar to this race. They are free from all diseases to which sheep are liable, hardy and prolific, and experience has proven that they readily adapt themselves to all portions of the United States. The bucks breed readily with the common goats, the second cross yielding a fleece of practical utility, whilst the fourth is but little inferior to that of the pure breed.

A flock of valuable wool-bearing goats can be raised in a few years by using grade bucks.

The following is an extract from a report of the special committee appointed by the American Institute at its exhibition in New York City in 1855:

They have examined with much interest the fleece submitted to them, and as well from their own observations as from the results of a microscopic examination made and certified to by several gentlemen of scientific eminence well known to them, they are convinced that the fiber of these fleeces is identical in character and fully equal in value to that from which the highly prized Cashmere shawls were made. The fleeces on exhibition, and now under examination, amount to from 4 to 8 pounds each.

The enterprise exhibited by the introduction of these animals into this country and their propagation can not be too highly regarded.

First. These animals are long lived, such being the case with the whole goat race.

Second. They are prolific, breeding at the age of 1 year, with a period of gestation of about five months, and yielding twins almost universally after the first birth.

Third. They are hardy, experience having shown that they will thrive well in our climate

from Georgia to New England, and that they require coarse and cheap food—as the inferior grasses, briers, bushes, etc.—such as is refused by other grazing animals.

Fourth. They produce a fleece of from 4 to 8 pounds, valued at from \$6 to \$8 per pound in France, or Paisley, Scotland, for the manufacture of those high-priced shawls. These fleeces can be produced, when the animals become numerous, at a less cost than the common sheep's wool and far superior to it.

Another fact of great practical value to our agricultural interests is the facility with which the Cashmere goats breed with the common goats of our country.

From these and other considerations, of the correctness of which your committee have entire confidence, it will be obvious that every encouragement should be shown this new enterprise—a bold and judicious movement.

B. P. JOHNSON.
CHARLES J. GOODRICH.
JAMES J. MAPES.

A committee for the New York State Fair, held in New York City in 1854, reported as follows:

The undersigned can not avoid the conclusion that in the goats imported, and whose descendants have been the subjects of this examination, we have the first-known specimens of that valuable race of animals from whose hairy fleece the celebrated shawls are manufactured known in commerce by the inappropriate name of "red camel's hair." As the fleece does not appear to have deteriorated in the comparatively warm climate of South Carolina, the distinctive character of the race is hard to be obliterated, while in the northern region of the United States this character can not well fail to be permanent. Viewed in this light, the introduction of this animal promises to be of more value to the agriculture of the United States than that of almost any other animal.

JAMES RENWICK.
JOSEPH R. CHILTON.
W. H. ELLET.

Many other similar reports were made by committees of fair associations about that time, but those quoted serve to show how favorably the goats were regarded. It should be stated here, however, that there are in these reports many erroneous statements. For instance, the goat is not the Cashmere; they drop twins only occasionally, and it is improbable that their fleeces ever during this period brought as high as \$6 to \$8 a pound.

All of the Davis importation of purebred Angoras were purchased in 1853 by Col. Richard Peters, of Atlanta, Ga., with the exception of one owned by Col. Wade Hampton, of South Carolina; one sold by Doctor Davis to Mr. Davenport, of Virginia; and one to Mr. Osborne, of New York. Colonel Peters later imported others from Asia Minor, which did not prove to be very satisfactory, as they were gummy. The Savannah Republican in April, 1860, said that Colonel Peters was selling his goats at very high prices, having received \$1,500 for one buck; that the president of an Illinois fair was so pleased with one of the bucks on exhibition there that he offered Colonel Peters "the weight of the buck in silver for it."

OTHER EARLY IMPORTATIONS.

The Country Gentleman for January 29, 1860, refers to a "recent" importation of 8 Angoras by Hon. William Henry Stiles, of Cartersville, Ga.; the exact date of their arrival is not fixed. Col. J. Washington Watts says of them that they came "just before the war." He said also that they were "larger and stouter than the Davis goats, but inferior in fleece."

The following statement by Winthrop W. Chenery, of Belmont, near Boston, on the two importations of goats which he made, was published in the Massachusetts Ploughman in 1862:

Two importations of these beautiful animals, purchased in Constantinople and consigned to planters in the South, have been landed upon the inhospitable shores of Massachusetts. The importations of the Angora, or Cashmere, goats, to which we refer, are at the Highland Stock Farm of Winthrop W. Chenery, of Belmont, near Boston.

The first of the two lots, consisting of 29 animals, was shipped at Constantinople on the 26th of March, 1861, and arrived at Boston on 15th of May, except two animals which died on the passage.

The second lot, consisting of 41 head, left Constantinople on the 6th of October, 1861, and arrived here on 25th of November, with the loss of but one animal.

Mr. Landrum states that further shipments of goats were made by Mr. Chenery, one of 20 head in 1866, another of 20 head in 1867, and that only about 30 of the 40 head arrived alive.

The Diehl and Brown importation of 160 Angoras was probably made during the year 1867. The Country Gentleman for December 12, 1867, says:

One hundred and sixty of these goats purchased by Israel S. Diehl recently arrived in this country and have been placed on the farm of C. S. Brown, of Newark, N. J.

C. P. Bailey, of San Jose, Cal., who furnished the money for the transportation to California, with the understanding that the first choice of these animals should go to him, says: "Some of these goats were fairly good and some were only ordinary. They were of medium size and, with the exception of the neck, tolerably well covered with fleece, which, however, had a scattering of kemp throughout."

The Price Maurice importation arrived at Galveston, Tex., early in 1874 for W. D. Parish, of Leon Springs, Tex.^a

EARLY DISTRIBUTION IN THE UNITED STATES.

Previous to the outbreak of the civil war there were many fair-sized flocks in the South and Southwest. There were smaller flocks in many of the Northern and Western States. Mr. Diehl, in 1863, mentions flocks containing from 300 to 1,200 and more in Atlanta, Ga.; Gallatin and Nashville, Tenn.; Russellville, Frankfort, Paris,

^a This statement is made upon the authority of Gustav A. Hoerle; but C. P. Bailey says he has never been able to verify the presence of this importation in Texas, and the writer is informed that Col. W. L. Black, of Texas, also fails to locate them.

and Georgetown, Ky.; Greenville, Lebanon, Montgomery, and Bucyrus, Ohio; Green County, Ind.; Chicago, Decatur, and Evanston, Ill.; St. Louis, Maramee, and Fayette, Mo.; Baltimore, Md.; Leavenworth, Kans.; Brownsville, Pittsburg, Washington, and Philadelphia, Pa.; New York City, N. Y.; Boston and Belmont, Mass.; Austin, Tex., and in the States of Iowa, Michigan, Minnesota, California, and in other localities. So it will be observed that they were so distributed as to test in a most excellent manner the several phases of our climate upon them. On account of the civil war, however, little or no progress was made in the South, where the largest herds were located and where most interest was manifested, until about 1866. Soon after the close of the war they spread out into the West, principally into Texas and California, where the natural conditions were most favorable, and where they have, quite unknown to the public, increased wonderfully in numbers and, in the light of recent events, in importance also.

In 1860 Colonel Peters sold two 16-months-old bucks to William M. Landrum, of San Joaquin County, Cal. They were sent from Atlanta to St. Louis by express; thence by steamer to Fort Leavenworth, and thence on foot to California with a wagon train. They subsisted on the journey by browsing on what other animals rejected, and arrived at their destination uninjured and in good condition. Mr. Landrum exhibited them at the State fair the same year, being awarded a silver goblet and \$25 in cash. One of the goats, after siring about thirty kids, died of snake bite; the other one, famous on the Pacific coast under the name of "Billy Atlanta," lived to be 10 years old, and then was accidentally killed. He had sired about two thousand kids. This buck won the sweepstakes prize over all competitors at every State fair down to his death; and Colonel Peters stated in 1876 that his numerous descendants were scattered all along the Pacific coast, and that "his blood courses in the veins of over one-half the Angora flocks in that part of the Union, estimated to approximate 70,000." Colonel Peters further stated "that about one-third of the purebreds introduced into California were contributed from the first and original (Davis) importation of 1849, and that their blood is present in probably two-thirds or three-fourths of the Angora stock on the Pacific coast."

Mr. Landrum was in California from 1850 to 1883, after which time he went to Texas, where, with his sons, he is still interested in the Angora goat industry. The Chenery importation was shipped by the British consul in Angora to Constantinople, where they were sorted by Mr. John R. Thompson and the American consul and shipped by a sailing vessel to Boston.

Ten head of the Chenery importation were taken to California and disposed of as follows: A pair to C. P. Bailey, San Jose, at \$500 each; a pair to Thomas Butterfield & Son, Watsonville; a pair to William M

Landrum, San Joaquin County; a pair to Mr. Pierson, Santa Cruz; and a pair to Flint & Sargent, Monterey County. This lot was the beginning of the breeding of thoroughbred Angoras in California. Prior to this but two Angora bucks had been taken into the State—the two which were sent by Peters to Landrum.

The Diehl and Brown importation was first taken to Ohio; and afterwards the entire lot, it is believed, was taken to California, where the goats were widely disseminated through the State, some of them bringing as much as \$200 a head.

The statement has already been made that the first goats taken to California were purchased of Colonel Peters by Mr. Landrum. In 1872 Mr. Landrum purchased all the goats under 8 years of age which Colonel Peters then owned and took them to California.

In 1875 William Hall bought of Butterfield & Son their entire flock of 150 goats for about \$17,000.

* IMPORTATIONS BY HARRIS AND OTHERS.

John S. Harris, a partner of Hall, started on April 16, 1875, from Hollister, Cal., on his way to Tibet with the purpose of purchasing Cashmere goats. Concluding, after reaching India, that these goats could not be acclimatized profitably in the State of California, he proceeded to Angora, in Asia Minor. After many difficulties he succeeded in purchasing 2 bucks and 10 does. On March 23, 1876, they arrived in Baltimore, having cost \$525 each landed in that city. These also went to California. It is said that the blood of this importation was felt beneficially in every good flock in the State.

An importation for which no positive date is fixed, made by C. W. Jenks, of Boston, and sold to Colonel Peters, is noted in a daily paper of Boston of January 31, 1880, which states that the steamer *Dorian* from Constantinople had arrived, having on board three goats for G. W. Jenks, of Boston. Landrum gives the date of this importation as 1873 and Schreiner as 1879. The daily paper referred to says:

They [the goats] were brought some hundreds of miles on muleback to the coast from the province of Geredeh, in the interior of Asia Minor. The Angoras heretofore received in this country have been from provinces near the coast and are smaller, with fleeces of 4, 5, and 6 pounds. The Geredeh breed is larger, with fleeces of 8, 10, and 12 pounds, and in some cases 15 pounds weight of mohair, very fine and silky.

There seems to be no evidence that this importation was very satisfactory.

On August 13, 1886, 2 bucks and 2 does arrived at New York from Delagoa Bay, consigned to E. A. Shults for Fink & Co., of Leon Springs, Tex. It is doubtful if this importation proved much of a success, as it has been heard of it.

THE BAILEY IMPORTATIONS.

In 1893 C. P. Bailey imported from South Africa two bucks. **Pasha** was one of these, and his get has been sent to nearly every State in the Union. In 1899 Mr. Bailey imported another buck from Cape Town.

Previous to 1901 the last Angora goats that had been imported into the United States from Asia Minor were those imported by John S. Harris in 1876; and previous to 1901 he and Israel S. Diehl were the only importers who went into the vilayet of Angora for their animals.

During the early part of the year 1901 Dr. W. C. Bailey, of the firm of C. P. Bailey & Sons Company, California, visited Asia Minor with the purpose of purchasing several head of Angoras.^a The vilayet or province of Angora was his objective point, as the best herds were reputed to be in that district. Many large flocks of excellent quality were found in the sheltered valleys.

Four animals were bought, and after innumerable difficulties were finally landed in New York and from there were taken across the country to California.

After the arrival of the goats in California they were kept to themselves for a time in order to be sure that they carried no contagion. The animals at once began to improve in flesh.

The Turkish bucks were bred to does of good quality, and in the spring of 1902 the first lot of kids by them arrived. The new blood showed itself in the fineness of fiber and closely coiled ringlets. The fleece of the kids was also very free from kemp.

In the fall of 1903 two lots of bucks by the Turkish goats were distributed to many parts of the United States.

It has been pretty thoroughly demonstrated that Turkish blood carries a very fine lustrous fiber, almost free from kemp, soft and pliable, but the fleece is not quite so heavy as the South African fleece.

The progeny of these four Turkish goats have taken many prizes at the live-stock shows.

THE LANDRUM IMPORTATION.

William M. Landrum, of Texas, who, as already stated, was the first to introduce Angora goats into California, succeeded in importing two yearling bucks from South Africa in 1901. They arrived at New York on April 20, after being seventy days on the journey, and on May 2 arrived at their destination. These two goats were

^a An account of Doctor Bailey's trip is given in an article by him under the title of "The Angora Goat Industry in 1901," published in the Eighteenth Annual Report of this Bureau.



FIG. 1.—ANGORAS IMPORTED BY WILLIAM M. LANDRUM, 1901.



FIG. 2.—ANGORA BUCK IMPORTED BY C. P. BAILEY & SONS CO., 1901.





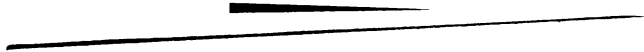
FIG. 1.—BUCK KID, KING ARTHUR II.

Born in the United States from South African parents. This kid sold for \$600.



FIG. 2.—SOUTH AFRICAN BUCK, KING ARTHUR.

Imported by G. A. Hoerle, 1905. Sire of kid shown in figure 1. Both goats are particularly good in amount and quality of fleece.



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FIG. 1.—SOUTH AFRICAN BUCK.

Imported by G. A. Hoerle, 1904. Observe the strong masculine character of this animal.



FIG. 2.—SOUTH AFRICAN BUCK, "WHITE."

Imported by E. L. Witt & Sons, 1905. This goat sheared 19½ pounds of fleece from 18 to 22 inches in length.



bred by a South African breeder, Mr. R. C. Holmes, their sire being Dick, which was the prize buck at the Port Elizabeth show in 1900.

The Bureau of Animal Industry received samples of the mohair from these two goats, which are very fine and lustrous. Prof. E. F. Pernot, of the Oregon Agricultural College, measured these samples of mohair and found that their diameters were, respectively, 0.00177 and 0.00218 of an inch. While this is very fine, it is equaled by many goats which have been bred in our own country; but the length and weight of the fleece of these South African bucks and their freedom from kemp are qualities of highest desirability.

THE HOERLE IMPORTATION.

Mr. G. A. Hoerle, now of Kansas, visited South Africa in the interest of the Angora goat industry. On May 29, 1904, he landed at New York with 147 head of Angoras from Cape Colony. The goats were first taken to Vermont, but at this time are in Kansas. These animals are of most excellent quality and breeding and have at this time been distributed to many sections of the United States. They will undoubtedly prove of much benefit to the industry through the infusion of their blood.

EXPORT DUTY ON SOUTH AFRICAN GOATS.

In 1901 South Africa passed a law which is usually referred to as "the Angora export duty act, 1901." This act provided for an export duty of £100 (\$486.65) on each Angora goat and each ostrich, and was to go into operation when the several governments of South Africa should agree upon a simultaneous date. For a few years the law was not put in force because Mozambique and Natal held aloof, but on September 20, 1904, Mozambique issued a decree ratifying the export duty. This was followed by a proclamation by the governor of Natal on December 13, 1904, providing that the law should go into effect January 1, 1905. The effect of this law is practically to prohibit further exportation of Angora goats from South Africa. But one importation has been made since it was put into effect.

THE WITT IMPORTATION.

E. L. Witt & Sons, of Texas, purchased a 4-year-old Angora buck from O. Cawood, of Cape Colony, South Africa, in 1905. The animal was landed at Baltimore, Md. This buck, "White" (Pl. 4, fig. 2), took first prize at the Port Elizabeth show in 1904. On arrival in this country he weighed 129 pounds and sheared 19½ pounds of very fine mohair averaging from 18 to 22 inches in length. The total cost of the animal, including the export duty of \$500 in South Africa, was \$1,575.

FOUNDERS OF THE INDUSTRY.

Credit should be given first to Doctor Davis for his public spirit in bringing Angora goats to the United States, whether they came from Persia, as he believed, or from Angora. Competent judges believe that they were the equal of any Angora goats that have since come to this country, and there are many evidences of their superiority.

Credit should also be given to Colonel Peters, who took great interest in these animals and preserved a nucleus of the flock he purchased from Doctor Davis, distributing many of the progeny over the country.

The civil war was disastrous in its effects upon the industry, and the Angora goats in the southern and eastern sections of our country were practically exterminated. The western men who adopted the industry, and finally saved it, were William M. Landrum, C. P. Bailey, and John S. Harris.

DESCRIPTION OF THE ANGORA GOAT.

Mr. Israel S. Diehl, bearing a commission from the Commissioner of Agriculture, visited the province of Angora in 1867 to investigate the mohair industry. Here, where there were once in operation 1,700 to 1,800 looms working up the mohair fleeces, he found but a few hundred remaining, struggling hopelessly against the fatal competition of European machinery and the aggressive policy of the European governments. The fleeces were exported to Europe for fabrication, thus rendering Turkey tributary to the monopoly then existing in this industry in Europe. The European demand for the raw material was so great and the facilities to fabricate it so much better and cheaper that Turkey was compelled to export the raw mohair. In order to meet the demands for manufactured mohair, the Turkish growers, without wise foresight, began the practice of crossing the Angora upon the common Kurd goat of that country. This fact has led judges of Angoras to express the belief that there are really no absolutely purebred Angoras in the world.

These conditions have produced various types of Angoras, even in Asia Minor, and a minute description of one would not apply to all. Some strains have foxlike ears, while others and generally preferred ones have long pendent ears. In this country care must always be exercised to cull the off-colored kids out of the flock. These may be the result of stavism, where a cross was made upon a common goat either red or black; but it is reported by some that different colors are found in the province of Angora among what were supposed to be purebred animals. Mr. Hoerle mentions having yellow and red goats in his own herd, and said that "some of the kids became quite a variety show."

Mr. S. C. Cronwright Schreiner, of Cape Colony, in his work on "The Angora Goat," has compiled the descriptions of almost all

writers on Angora goats. He quotes Mr. Henry O. Binns, who spent twenty years in the mohair districts of Asia Minor between 1864 and 1886, and who studied them during that time, as follows:

The pure Angora in his prime is about the size of a five-months-old Cape [Cape of Good Hope] kid, with small thin horns, wooled all over the body, their hair almost covering the eyes; exceedingly delicate, and so subject to disease that no one cared to keep him. What is to-day called the purebred Angora is like the English thoroughbred horse—the result of crossing and recrossing until body, class, points, etc., have attained to what is generally considered that the thoroughbred Angora ought to be.

Mr. Schreiner's opinion of what a purebred Angora is, given on page 58 of his book, is as follows:

I think it is certain that the original purebred white mohair goat was a small, very refined, delicate animal, of great beauty, clipping at twelve-months' growth of fleece about from 2 to 4 pounds (according to age and sex—kids considerably less) of dazzling white, fine, soft, silky, very lustrous mohair, curling in ringlets from 10 to 18 inches long, with merely the minimum of oil in its fleece requisite to the growth of hair of the highest excellence, so small in amount as to be inappreciable to the unskilled observer. It was perfectly clothed in every part; it had short, silky, curly hair about the face and down the lower parts of the legs to the hoofs; a soft, silky, curly "kuif" (tuft on the forehead), and small, thin, light-colored horns. The ewe was of course smaller and finer than the ram, and had only one kid at a birth (of this there is abundant evidence).

Although Mr. Schreiner thinks the Davis importation to this country was among the best bred goats that ever left Turkey, it will be noticed from the pictures of two of them shown herein (Pl. 1), which were said by Colonel Peters to be excellent, that the mohair does not extend "down the lower parts of the legs to the hoofs." It is doubtful if any such Angoras may be found existing at this time, however probable they might have been in their original purity.

The following is quoted from Dr. John Bachman,^a of Charleston, S. C., who was appointed by the Southern Central Agricultural Association of Georgia to report on the Angoras belonging to Colonel Peters of Atlanta:

The Angora goat, more especially the varieties it has produced, is described by Hasselquist (1722–1752), Buffon (1707–1788), Pennant (1726–1798), and others as in general of a beautiful milk-white color, with short legs, and black, spreading, spirally twisted horns. The hair on the whole body is disposed in long, pendent spiral ringlets; its ears are pendulous, and the horns of the female, instead of divaricating, as in the male, turn backward, and are much shorter in proportion.

Mr. Diehl^b (1863), adopting to some extent the same language as Dr. Bachman used, describes the Angora as follows:

The Angora goat, and more especially the varieties it has produced, are probably the most valuable of all the goat family, and have been ably described by Naturalists Buffon, Pennant, Hasselquist, and travelers as good-sized animals, generally of a beautiful milk-white color, with short legs and wide-spreading, spirally-twisted horns. The wool is described as a very beautiful curled or wavy hair of silvery whiteness, with a fine downy wool at its base, and

^a "Report on Asiatic Goats," United States Agricultural Report, 1857, p. 58.

^b "The Goat," United States Agricultural Report, 1863, p. 222.

this hair is disposed in long, pendent, spiral ringlets on the whole body. The horns of the female, instead of spreading, as in the male, turn backward, and are much shorter in proportion. Those of the male are long, spirally twisted, but the size and direction are very different from the common goat, being generally extended from 15 to 30 inches in height on each side of the head, while those of the female are near the ears. The hair, or wool, often sweeps to the ground, and is usually from 5 to 12 inches long, especially in the older bucks, but then not so fine.

This brief description, he said, applied to all the Angoras which he saw in western Asia, Europe, and in this country, which amounted to several thousands, except as to a difference in ears, for, while some had pendent ears, others which he examined had ears exceedingly small and short.

Mr. Diehl also mentions a variety of this goat in Angora which was hornless. There is reason to believe that an intelligent system of breeding would produce such result. Such an end has been attained with cattle and is entirely feasible with goats.

A few years ago, before much effort had been made to improve the Angora goat, it was described as a little animal; but under favorable conditions its size has been greatly improved, although it is yet considerably smaller than the average sheep. The future may cause a change of opinion as to the weight that is desirable, but at this time it is believed that the aim should be to produce animals weighing at maturity from 60 to 100 pounds.

Males and females alike have horns and beards, except that in rare instances an animal without horns may be seen. The horns of the male grow to a length of 18 to 20 inches and turn upward, outward, with a backward twist, while those of the female, which grow to a length of 8 to 10 inches, grow upward and point backward with only a slight inclination to twist.

The body should be round and broad throughout its length; hips and shoulders of equal height, as low shoulders indicate a delicate constitution; hips not sloping in a pronounced degree; chest broad; legs short. The head should be broad, with a wide muzzle and bright eyes; ears may be partially upright or distinctly pendent.

The fleece should cover all parts of the body except the inside of the upper legs. While some animals show mohair down the legs to the feet, this does not indicate a better individual than may be found among those that have no mohair below the knees and hocks. It does indicate, however, a strain producing a larger fleece. A topknot is pretty, but does not indicate quality. The fleece should make an annual growth of not less than 8 to 10 inches and be so dense upon the animal as to yield from 4 to 6 pounds. The ringlets should be well formed from point to skin, and the tighter these ringlets are twisted the better; loose, slightly wavy hair is objectionable and indicates coarseness and brittleness, and often lacks luster. It is of the utmost importance that the hair be extremely fine—the finer the more valu-

able. The ideal Angora will be free from kemp. No other thing tends so surely to reduce the value of the fleece as the presence of kemp; and the more kemp there is present the less valuable the fleece, no matter how fine the mohair may be.

A characteristic of the common goat that is very objectionable is the ever-present offensive odor from the bucks; in the Angora breed this odor is entirely absent, except at the rutting season, and then it is noted in a slight degree only. The odor in a fleece of mohair is milder than that in a wool fleece, and is not at all offensive.

NAMES OF BREED AND SEXES.

NAME OF BREED.

There was no difficulty in dropping the name "Cashmere" as soon as it was known that the Angora goats did not belong to that breed, but there are a few uninformed persons who still refer to them as Cashmeres. Owing to the prejudice existing against "the goat," it has been suggested and strongly urged by some that the easiest and quickest manner of ingratiating the Angora goat with the people is to drop the word "goat" altogether and call them simply "Angoras." In other words, it is proposed to pretend that this animal does not belong to the goat family. It would still be a goat notwithstanding, and students of science would forever be pointing out the pretense. Besides, the use of the name "Angora" alone would almost certainly lead to the commission of errors. Everything of American origin is referred to as being "American," and the various animals from the vilayet of Angora could with equal propriety be called "Angoras." For instance, the long-haired cat from that province is quite well known in this country and is called an "Angora."

NAME OF SEXES.

There are no well-established names for designating the sexes of goats. The male is indiscriminately called "male," "sire," "buck," "ram," and "billy," and the female, "doe," "ewe," and "nanny." Oftentimes a writer uses two or more of them in one article, showing that he has not adopted any of them. Correspondents have been asked whether they designated the male "buck," "billy," or "ram," and the female "ewe," "nanny," or "doe." More than half of those who replied called the male "buck," and nearly half called the female "doe." The objection of one writer that the plural of the female, "does," conflicts in reading with the verb "does," will not hold, as a sentence will not "make sense" with the one word used for the other. In this bulletin it has been decided to refer to the sexes as "buck" and "doe."

The castrated animal is called "wether," as with sheep. In Cape Colony he is called a "kapater," and the sheep wether is there called a "hamel;" but there is no reason why we should adopt these terms.

The young is called the "kid." There seems to be absolute unanimity in this matter.

BUILDING UP A FLOCK.

THE BEST FLOCK.

It is assumed that whoever goes into the business of raising Angora goats does so for the production of mohair rather than of meat or skins, and so it is to his interest to have a flock that will yield a profit from the beginning. The best flock for this purpose is one composed of thoroughbreds.^a Such a flock will yield good mohair from the first.

Those who enter upon the business of goat raising, however, must make their operations conform to their capital, the same as in any other business. They will find that desirable does will cost from \$8 to \$15 each, and bucks all the way from \$50 to \$100 each; so that a large herd of this kind, although preferable, will cost a small fortune, and is beyond consideration by most people who will engage in the industry.

FROM A SMALL BEGINNING.

Another plan that may be pursued by one who has limited capital, but time and the patience to wait, is to begin with a few first-class animals and build up a flock from these. The result will be satisfactory, and the only drawback is the length of time required.

BY CROSSING UPON COMMON GOATS.

It is noted in the historical part of this paper that the Turks many years ago began the practice of crossing Angora bucks upon Kurd does. They probably had in mind the twofold purpose of producing thereby a hardier goat than the pure Angoras and of increasing the number of goats in order to supply the increased demand of Europe for mohair.

Many of the large flocks of Texas and New Mexico have had Mexican does for their foundation. Building up a good mohair-producing flock upon this plan requires five or six years. The advantages are that the does with which the beginning is made are cheap, costing from \$1.50 to \$2.50 per head. During the first and second crosses there are many twin kids, thus increasing the herd in that proportion—a condition not existing, except to a small extent, among thoroughbred Angoras;

^a The term purebreds is not used here, as there is strong objection to it by many of the best breeders, on the ground that there are no purebreds, as explained elsewhere. As the term thoroughbreds will exactly suit the purposes of this section, it is preferred, leaving the question of purebreds to be discussed by others.

the size and hardihood of the progeny are increased and the liability to disease decreased.

However wise the practice may have been, that method of building up a flock of fleece-bearing goats is now in vogue but slightly, if at all. The practice flourished best when the goat raisers knew very little of the larger prices they might have obtained for a better grade of mohair. They were content with prices ranging from 14 to 22 cents a pound. Manufacturers have required better hair than can be produced by grades, and this has tended to reduce very greatly the number of crosses. The profits resulting from such crossing are doubtful.

Care should be exercised in starting a flock by this method to select only such common does as are entirely white; any other color, however slight, is objectionable. If otherwise, the results might be satisfactory, but the probabilities would be the contrary. In handling the crosses the breeder often finds that atavism becomes apparent when it is most objectionable. For instance, the progeny for two generations of a doe having black spots might appear all that is desirable, while the third generation would produce the latent color.

It is always quite necessary that the common does should be of the short-haired variety. Long-haired ones will give trouble in persisting to throw out long hairs among the mohair.

The buck used upon these does should be the best one can afford. The better the buck, the better the result. There will be many twins among the kids from this first cross, and if proper care is exercised at kidding time it will not be difficult to increase the flock as much as 100 per cent. The higher the cross, the fewer twins will be dropped. As the fleece upon the first cross is not worth more than the effort to clip it, the males among them should be castrated when about 2 weeks old and disposed of for meat as soon as old enough. The females among them, being half-blood Angoras, are kept for service with another thoroughbred buck. The result of this second cross is three-quarter blood Angoras. The mohair from them has a marketable value, but is very limited in quantity and usually mostly kemp. It is best to deal with this cross in the same manner as with the first cross. If this method of procedure is followed up to the fifth or sixth cross, a flock will result that will produce most excellent mohair.

It has no doubt occurred to the reader that we now have four or five different grades of does, beginning with the common breed. Therefore after a high-grade flock has once been produced in this manner, each year brings forth another one from the same sources, and this condition continues as long as the breeding life of the does continues.

While the foregoing paragraphs tell of crossing upon common stock, it is a practice that is not recommended and should be discouraged at

this time. Breeders are doing their utmost to produce an animal that is free from kemp, and this method of crossing upon common stock works against that purpose.

MANAGEMENT OF A FLOCK.

AGE FOR BREEDING.

Goats of both sexes will sometimes breed when they are 5 months old, and often at 6 months, but from the fact that they are at this age but a month or two from weaning time and are not nearly full grown, it is obvious that they should not be permitted to breed. They reach maturity when about 16 or 18 months old, and they ought not to breed before this time. If bred earlier, the kids will not be so strong or

so well developed. The goats are in their prime when from 2 to 6 years old, but with proper feeding in winter they have been known to breed regularly until 15 years old. The average life of goats, however, is about 12 years. There should be no tendency to keep does until they are very old unless they bring kids of exceptional merit, for it must be remembered that their mohair gets coarser, and consequently less valuable, as they grow older.

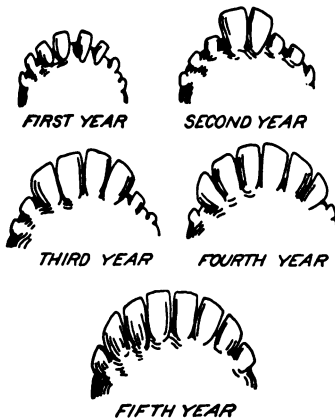


FIG. 1.—How teeth show the age of goats.
(Copied from Bryan Hook's "Milch Goats and their Management.")

The accompanying illustration (fig. 1) shows how the age of goats may be determined until they are 4 years old.

After that, in the absence of definite information, the age is a mere matter of guess, based upon the general appearance of the animal. The new teeth are longer and larger.

IN-AND-IN BREEDING.

In-and-in breeding means the breeding of related individuals. The term is indefinite, and with some refers to a close relationship and with others any degree of relationship. The correspondence of the Bureau with goat raisers shows that the term with them means generally the breeding of individuals of close relationship. There is an overwhelming sentiment against the practice because of the injurious effects upon the constitution of the progeny. It is quite generally agreed, however, that this practice will give a fleece of finest fiber, having a beautiful luster and little oil, but the weight will not be so great. Those who favor the practice contend that the quality more than offsets the quantity. The animals resulting from this practice are not so large and

strong as those which are not related. The fact must not be overlooked, however, that Mr. John S. Harris followed in-and-in breeding continuously and with evident success in a climate where the temperature in winter was sometimes far below zero. But Mr. Harris is a gentleman who understands the art of breeding; if all goat raisers knew so well the principles of breeding as he does, there might not be so many to condemn the practice. However, they have learned much by experience, and it can not be contended that they are wrong in advising generally against the practice. Col. Richard Peters, the most successful breeder of his day, said that half-blood does can with best results be bred to their own sires, provided the sires have proved themselves to be good breeders.

MANAGEMENT OF THE BUCK.

Bucks usually come in heat about the middle of July and continue so about six months; does, however, do not usually come in heat until the latter part of August or the first of September. As the period of gestation in goats is from 147 to 155 days (or about five months), care must be taken in mating the animals in order to have the kids dropped in proper season, which will vary somewhat with the locality. The kids should not come before the warm days of spring, or when vegetation begins to put out vigorously. Therefore the buck should be put to service from November 1 to December 1, so that the kids will come about the 1st of April or May. The only objection to earlier kidding is the extra care required to preserve the life of the kids, for they are, like lambs, quite delicate for a few days, and exposure at this season should be avoided.

A buck, like any other domestic animal, should be in the best possible condition when put to service. He should be well fed with grain for a few weeks before this time, and the feeding should be kept up until a few weeks after his service is ended.

As to the number of does which a buck may serve, there is a great diversity of opinion. The greater number of goat raisers, however, think forty or fifty are all that may be served with good results. Col. Richard Peters wrote that he had obtained the best results with two hundred breeding does by turning in with them ten selected bucks. His object was to have the kids come as nearly at one time as possible, thus shortening the period of careful watching.

Where there are very large flocks it is not always desirable that the kids should all come at one time. If they are dropped at intervals for a month, one attendant may thus be enabled to look after a large number, whereas if all come about the same time, one attendant could not do the work, and assistants who may be strangers to the flock would be necessary. (It is not well to have many strangers with these goats at any time, and certainly not at kidding time.)

The handling of "riginals" (ridgels) should have a word here. If the one testicle which descends is removed, the riginal will not get kids, but he will bother the does. If the descended testicle is not removed, he will breed without difficulty. He should be killed as soon as practicable.

NUMBER OF KIDS.

Thoroughbred Angora goats do not often drop more than one kid at a time, while the common goats nearly always drop two. There are many twins with the first cross, but the number diminishes as the crosses become higher. It is stated that the purebred Angoras never dropped but one at a time, and that the presence of twins in a flock is evidence of a base origin of the goats. The latter statement is disputed by some, who believe that the purebred Angora (having no trace whatever of base blood) will drop twins as regularly as the common goat. Good handling of a flock ought to give a kid for every doe, and there are instances of an increase of 120 per cent in a flock. In the Southwest, where the flocks are very large and on ranges, and where no particular care is given at kidding time, the percentage of kids is about 70.

KIDDING AND THE KIDS.

The kidding time is the most important in the life of the goats. For two or three days after the kids are dropped they are naturally quite delicate, and there will be no future success unless good care is given at the time. They can not "rough it" at this period, though after a few weeks, when the kids are large enough to follow the flock, they will be able to care for themselves very well.

The proper time for kids to arrive is in the spring, about the time when leaves start on the trees and bushes. At that time there is milk-producing food for the doe, and the weather is also warm enough to favor the kids. The exact time may be governed, of course, by the service of the bucks, and will be earlier in localities where the seasons are earlier. If kidding comes in cold weather, there will be greater difficulty in saving the kids. Warm stabling must also be provided, and the does will require extra feeding in order that they may supply milk for the kids.

A few days before a kid is due the doe should be separated from the flock. Some breeders would put her in a pen alone, while others would put as many as 20 in one pen. If the facilities are at hand, a small pen for each doe is better, for the reasons that the doe will sooner "own" the kid and there will be less danger of injury than if among a number. A doe knows her kid by the sense of smell, especially when it is young. This characteristic is so strong that some breeders assert that if two kids of different mothers are rubbed together, the does will often refuse to own them. Whoever cares for



FIG. 1.—KIDS STAKED IN SHED.



FIG. 2.—ANGORA KIDS.

The black kid is an interesting instance of atavism ("throwing back") in Angoras.

the doe at kidding time will find it an important part of his work to see that the does own their kids. This difficulty in any case will disappear in a few days, and it will then only be necessary to arrange for the does to get to the kids whenever they desire.

If kids are dropped on the range or in the pasture, they must be carried home and special care given to see that the does are made to own them, for many times they will refuse. A lamb will follow its mother very soon after it is dropped, but a doe will hide her kid as best she can in bushes, or behind a stone or log, and leave it there while she goes away to feed, and on her return she expects to find it where she left it.

The Mexican method of handling the kid is largely practiced in Texas and New Mexico, and consists in "staking," or "toggling," the kid. When the kid is dropped, take it to a protected place (shed or barn), seeing to it that the doe follows, and "stake it out" or "toggle" it with a string about 14 inches long. Tie this string to one leg, changing occasionally to other legs to avoid lameness. This string should have a swivel in it to prevent twisting, and the kids should be carefully watched so long as they are so tied, which will be from seven to ten days. (See Pl. 5, fig. 1.)

The does should remain with the kids until they leave them of their own accord to go out for feed. The kids may then be allowed to run loose in a pen together until they are large enough to go out with the flock, which is when they are from four to six weeks old, or when they are able to jump a board from 12 to 20 inches high placed across the gate. The height of this board restrains the kids that are too small to follow the flock and at the same time enables the does to go and come as they please.

The following is from "California Angoras," published by C. P. Bailey & Sons Company:

There are in use two methods of handling kids at kidding time—namely, the corral method and the staking method. Each of these has points which render it most valuable under certain conditions and in certain localities.

THE CORRAL METHOD.

This method may be used with any number of goats. With various modifications and adaptations which best suit the size of the flock, the climatic conditions, the facilities for feeding, etc., it may be used by the beginner with success. We have practiced this method in Nevada for more than twenty-five years. If the herd is a large one, say 1,000 head, three men are required to handle the goats at kidding time. The service of the bucks is so managed that the kids will be dropped gradually through several weeks. At the height of the season we expect from 75 to 100 kids a day. The season lasts about thirty or forty days. Fortunately, most of the kids are dropped in the daytime.

We have four or five small corrals fenced with 36-inch woven wire and large enough to hold 50 does and their kids. The doe should be allowed plenty of room, because if too close to her neighbor she may adopt the other doe's kid. Besides these small corrals, two large ones

are needed, each large enough to hold 1,000 does. Along the fence of one of these corrals are a dozen small pens just large enough to hold a doe and kid. At the gate of this large corral a jump board is placed. This jump board is intended to keep back those kids which are not large and strong enough to jump over it. A 2-inch board about 18 inches high will answer the purpose. Another device sometimes used is a platform open at the end, so that the kids may run under it, and thus avoid being trampled upon when the goats are going out over the platform.

The small corrals may be made of panel fence and located in a meadow where some feed is afforded. The does should always have some kind of feed at kidding time.

In the morning the flock is carefully examined, and all does which show signs of kidding during the day should be separated and placed in one of the small corrals. The large flock is now turned out, and one of the men is sent with them, with instructions to take the herd at once as far as he intends to go for feed that day, and then to let them feed over a limited area and gradually work their way home. A few does will drop their kids on the range, and the herder should carefully note the number and their location. He should see that the herd does not feed around one of these does, as she is apt to leave her kid and join the band, thus necessitating much extra work in finding the kid and in giving it to its mother. Early in the afternoon the band is placed in one of the large corrals. Now, the herder and another man go out with a wagon or on foot and carry the kids home, gently driving the mothers. The kids should not be handled or rubbed against one another more than is necessary, as the doe knows her kid by the scent. These does and kids are placed in the small corral which contains the does held back in the morning with the expectation that they would kid during the day. We now have one day's kidding in one of the small corrals. The does and kids should be watched to see that they are properly arranged. Do not bother them more than is absolutely necessary. Do not be in a hurry to make a doe own a kid. Do not drive the goats around one of the small pens.

The does should remain with their kids in the corral for a day or two at least, or until the kids are properly mothered. Any does which have not kidded should be taken out. The next morning any kids which may have been born during the night are put in another small corral with their mothers, as well as the does which are expected to kid during the day. The procedure of the previous day is repeated. In about three days, if one has limited quarters, the first day's mothers and kids may be put in the second large corral—that is, the one with the jump board at the gate. Now this "wet" band is placed in charge of one of the men and sent out to feed. The gate is opened, the mothers passing out over the jump board, and the kids remain in the corral. The herder must not range his goats near the does that are kidding upon the range, and he should be cautioned to come in later than the "dry" band, so as to avoid any possibility of their mixing. When his band arrives at the corral, the gate is opened, and each mother hunts for her kid. Some of the kids may not find their mothers, and if after a day or two there are a few unnourished kids and some does with over-distended udders they should be placed together in the small pens along the side of the corral. The doe will own the kid in a day or two, whether she is its mother or not. The kids should not be allowed to become too weak before this is done. If one does not have enough small pens, a doe may be held while two or three kids suckle her, and thus tide them over until some of the small pens are vacant.

The next day the second day's kidding is added to the wet band. The wet band thus gradually grows, while the dry band decreases. During the day two men will be employed at herding the dry and wet bands, respectively, and the third man will be kept busy inspecting the kids, feeding the does in confinement, etc. If the weather is stormy, some of the kids will have to be sheltered. The advisability of having the kids dropped gradually through a period of thirty or forty days will readily be seen. If help is inexperienced, they may be gradually trained, or if the weather is stormy there will be time to get all things arranged properly.

The kids should not be allowed to go with their mothers until they are about 6 or 8 weeks old. If they go before this, they will probably become tired very soon and go to sleep.

When they awake, the band will have gone, and they are liable to be lost. During the day, while the mothers are feeding, the kids would eat a little grass if they could be herded near the corral.

As stated before, there may be many modifications of this method which will suggest themselves, but the above is a general outline of a method commonly in use.

THE STAKING METHOD.

This method is largely employed, even with large flocks, in New Mexico, but is possibly best suited to small flocks. It is without doubt the best method for certain surroundings. About the same amount of help will be required as with the corral method. There should be a good supply of stakes similar to tent stakes. There should also be a supply of swivel blocks which are about 4 inches long and having a hole bored near each end. A piece of rope about 6 inches long is fastened to the stake, and the other end is passed through one of the holes in the swivel block and a knot tied in the end. Another piece of rope of equal length is likewise knotted and passed through the other hole of the swivel block, the loose end being tied to the kid's leg. Any swivel will take the place of this primitive method. The herder or owner can busy himself during the winter months by making stakes and swivels and by cutting and attaching the ropes.

When a kid is born it is taken to a convenient place to stake, and the mother is gently coaxed to follow. The stake is securely driven into the ground, and the kid fastened to it by the hind leg. The mother is left with the kid, in order that she may know where to find it upon returning from feeding. The kid should be staked where he can get plenty of sunshine, shade, and shelter. A small bush, a post, or a box will answer the purpose admirably. If there are twins, they must be so staked that they can suckle at the same time. The rope should be changed from one hind leg to the other occasionally to prevent unequal development. Sometimes a vigorous kid gets thoroughly tangled and requires help.

The kid may thus be left staked until he is old enough to go with the flock, which is after six or eight weeks, or he may be put in a corral after a few days, as is done in the corral method.

There are many successful breeders who use this method entirely. One may expect to get good results if he follows either the corral or staking method carefully.

There is very small loss among kids cared for as set forth above. Many of the breeders on a large scale report the percentage of increase as 100. This does not mean that every kid lives, but that so few die that the loss is offset by the number of twins that are dropped.

The most practicable fencing to be used at kidding time is made of portable panels. By the use of these panels a pen may be made large or small and be moved from one place to another without difficulty and with very little work.

WEANING.

Kids should not be weaned until they are 4½ months old unless they are very strong; but they should not remain with their mothers after they are 5 months old. This especially applies to the buck kids, as they will often breed at 6 months of age or even younger.

CASTRATION.

The buck kids not reserved for breeding purposes should be castrated when about two weeks old. The earlier it is done the better will be the meat and the mohair. It is pointed out in previous pages

that the mohair from wethers ranks with that from the does, and the flesh is superior to that of the does and inferior only in small degree to that of the kids. A cool day should always be selected for the operation of castration and careful attention given for a few days.

SIZE OF FLOCK.

All goat raisers agree that Angoras can not stand crowding together, and the higher the grade of the goats the more susceptible are they to injury from crowding. But to state just how many should be kept in a flock is difficult, as the number depends upon the character of their restraint. Where they have the range at day and large yards at night, the flocks may be very large, but where they have pastures and small pens at night the flocks must not be large.

Much stress should be laid upon the matter of overcrowding, as it is a more serious matter than is generally recognized. Goats will not stand what sheep do in this respect. They require much fresh air, and many persons who have taken their animals from the South to the North have done an injury to the flocks by providing barns that are too warm and that have not sufficient ventilation.

Schreiner states that 300 is about the average size of a flock in Turkey. A man and a boy can herd a flock of this size safely, and sometimes they are assisted by large wolf dogs trained to protect the goats.

CARE OF A FLOCK.

The preceding pages have no doubt given the impression that Angora goats are very hardy, and, indeed, it is true, especially if their foundation is upon crosses with the common goat; but this should not be taken by the careless or shiftless man as a license to subject his goats to all manner of discomfort with the expectation that the results will be fully as satisfactory as if rational attention were given them. That these animals can withstand extreme cold, such as that of the islands of Alaska, or extreme heat, such as that of Guadalupe Island, is strong evidence of their fortitude and of their adaptability to a wide range of temperature under proper care. The same fortitude is exhibited by horses, cattle, sheep, and hogs, but no one thinks of turning these domesticated animals out upon their own resources, as wild animals are forced to exist. That they can subsist upon vegetation which is utterly useless for any other purpose is evidence simply of their economical keeping; it does not permit one to conclude that they never need any other kind of feed at times. In a word, it is intended here to impress the fact that, if satisfactory results are to be obtained in goat raising, the animals must receive the same rational treatment that is received by other live stock when best results are sought. The goat is a hardy animal in the fullest sense of the word, but this char-

acteristic only enables him to respond the more quickly and satisfactorily to careful treatment.

Information which has been received by the Bureau of Animal Industry through correspondence shows that the press, in its efforts to exploit the good features of these goats, has to some extent exaggerated the facts. It seems to be a favorite saying that "they live on nothing," and men who would not think of putting a horse, a cow, or a hog upon its own resources in a pasture in winter where the snow may be a foot deep have done so with their goats, and have wondered why they did not thrive. Now, it is true that thousands of goats pass through a winter and thrive well where the snow is deep and the thermometer low, but they get something to eat every day, and plenty of it. The goat will browse just as eagerly in the winter upon soft twigs as in the summer, but the twigs must be within his reach.

Goat men of experience leave all trees which the goats can not destroy in the summer until the winter and then cut them down. It is "a goat's paradise," as one correspondent states, to be in these tree tops. They will eat the soft part of the twig—2 to 4 inches. This is feed for goats—and good feed, too—although it is such as no other one of our domestic animals will subsist upon.

There is another feature of winter browsing which is of importance, and that is that the goats ought to enter the winter in good condition. If for any reason they can not get into good condition in the summer and fall, when there is so great an abundance and variety of brush and weeds, little can be expected of them in winter on feed less in quantity and variety. On every farm where goats are kept some sort of coarse fodder and grain should be provided, in order that they may be available at times when storms will keep the goats under cover. In some winters this sort of weather may last only a day or two, while in others there may be two or three weeks of it.

No amount of cold will prove injurious to the goats, but the caution may well be repeated that they should be kept dry, especially in cold weather. A shed of easy access that will turn water is one of the essentials of goat raising. It should be so constructed that the water will not drop from the eaves. It should not, however, be perfectly tight, so that the air can not have the freest circulation. Many goats will die from being too closely confined in warm sheds or barns before their owners will realize the fact. Kindness in this respect is dangerous and expensive. Angoras will show their ability to withstand extreme cold and extreme heat if proper shelter and feed are provided.

HERDING AND FENCING.

Goats require a great amount of exercise, much more than sheep. The one is by nature a browser and the other a grazer, and the browsing habit naturally requires more activity on the part of the goats.

They are sensitive to restraint and do better if not herded, but of course this is often a necessity, and therefore should be done under as favorable circumstances as possible. So far as possible they should not be allowed to feel their restraint. If constant attendance is necessary, the herder should be of quiet disposition. The next best thing to the freedom of a range is a large pasture, where the goats may have oversight, but not constant attendance. Such pastures are considered the cheapest method of keeping these goats. They can easily be trained to come home by feeding a little and salting regularly at home.

The fencing for pastures is a matter which early concerns one who contemplates going into the business, for it is the current belief that goats will climb onto any shed of ordinary height or jump any fence that will stop other animals. While they will climb anything that is built in such a manner that it may be climbed easily, they will not jump any ordinary fence. They will, however, creep through if there is an opening large enough. The old-fashioned "worm" fence, especially if it leans outward, will not stop goats. The angles in such a fence are an incentive and a delight to them. Indeed there are many hogs that will go over a fence of this kind.

In building a goat fence there are other matters to be taken into account than simply that the goats shall be kept in; the animals themselves (especially the young ones) must be protected from dogs and wolves from the outside. In the Southwest it is much more important to fence to keep "varmints" out than it is to fence to keep the goats in. So the double object must be kept in view in building a goat fence. Such a fence must be dogproof, hogproof, and wolf-proof. A hog at liberty which has once had the taste of chicken, or lamb, or kid is a greater nuisance than any wolf or dog, and should be dispatched as being an enemy to other young live stock as well as kids. It often occurs that dogs and wolves do their worst work at night, and they generally go upon their forays in groups of two or more. The sheep-killing dog is exceedingly cunning.

Fences made of any material may be suitable, but the manner of construction is the important feature. In order to convert brush land into pasture, a ten-strand barbed-wire fence, with posts set 16 feet apart and having two stays between, is a very good one. The lowest wire is only 1 inch from the ground, the next four wires $3\frac{1}{4}$ inches apart, and one-half inch is added to every space above the first below it. Taut wires are very necessary. Woven wire, although somewhat more expensive than barbed wire, makes a much more satisfactory fence. A good fence may be made of woven wire 3 feet high, drawn on the inside of the posts, and a closely barbed strand of wire 3 or 4 inches above fastened to the outside of the posts to prevent animals from jumping in. A straight rail fence, if the rails

are laid close enough, as well as an ordinary board fence, will turn goats. Zigzag or worm fences are an incentive for goats to climb. A five-board panel fence 4 feet high is sufficient for goats.

SHELTER AND PENS.

A shelter is necessary during wet spells, and more especially if the rain is cold or in case of a sleet storm. Dry cold alone has little or no injurious effect after the kids are three or four weeks old, and they will even frolic in the snow when the mercury is at zero, and sleep with apparent comfort in an open shed. With their dense covering there is no reason why this should not be true; but this same dense covering, when soaked with cold water or driven full of sleet, is a deadly menace. Goats will not get wet if they have an opportunity to avoid it. They appreciate a shelter and will always seek it at night, and during the day in the event of storms. They are said to be excellent barometers, being able to foretell stormy weather, and always contrive to place themselves under shelter before the advance of a storm, if possible. Mr. Diehl says they will run miles to avoid an undesirable rain.

Goats should not be left on the range or in pasture overnight. The latter is practiced to a considerable extent, but experience has shown that they are safer in closer confinement during the nighttime.

The pens in which the goats are kept at night should, above all things, be in such a location that they can be kept dry by drainage. Other live stock should be excluded, as they would only help to trample the ground into mud. The goats should have a dry place to stand and sleep, for they are apt to contract rheumatism in the knees. There is little use in raising Angoras for their fleeces if they are compelled to wade through mud and filth, or confined under these conditions. The fleece would soon become so soiled and matted as to be a "burden unto death."

The sheds provided for their shelter must be of a size to give an abundance of room. The goats should not, under any circumstances, be huddled together. If they are thus crowded in cold weather they will pile up, with the result that some of the younger ones will die from suffocation. One writer states that he has known as high as 30 being killed in this manner in one night. Mr. Oscar Tom, of Oregon, describes in the following language a shelter that proves satisfactory:

The sheds should have eave troughs, and be boarded down to within 3 or 4 feet of the ground. There should be a ditch around the shed to prevent any water from running into it, and it should be open all around, so that the goats would not have to wait for others ahead of them to go in. A few cross ones could not block the way and keep other goats in or out, and the rain would not blow in, but the goats would have plenty of fresh air. There should be a good fence around the shed at a distance of at least 50 yards to keep cattle and horses from tiampling up the ground and working it into mud. Have the fence high enough for the goats to go under, but never allow hogs to run into the goat shed, for goats are easily frightened after dark.

In some parts of the country the strong winds will blow rain under a shed such as Mr. Tom describes. In such cases, the side from which these storms usually come might be boarded to the ground. A better plan, in the opinion of some, is to have a few solid movable panels of fence to place around the openings of the shed on such occasions. This plan is convenient, too, as the panels may be taken away in fair weather, thus permitting a free circulation of air from all sides.

Shelter from the sun's rays should be provided for summer time. Although goats are able to withstand intense heat, they do not thrive well when subjected to it. For this purpose sheds more open than that described above are preferred, for the reason that the air will have freer circulation. Better yet than a shed against the sun's rays are large trees. In this case there is no obstruction whatever to the air.

FEEDING AND SALTING.

The principal reason why goats will be raised instead of sheep in some places is because they are practically inexpensive so far as feeding is concerned. This phase of the subject is quite fully discussed under the head of "Browsing and pasturage." They eat the leaves in summer and the soft twigs in winter, and if there is an abundance of either they will not require anything else to sustain life; but this condition exists only in certain localities, and other means must be adopted elsewhere. They are fond of straw and fodder of any kind.

Notwithstanding the ability of goats to subsist upon coarse fodder in the winter season, the impression must not be held that they will thrive well upon it in the absence of browse. They will extract from these fodders all the nourishment obtainable, which is not very great, but must receive some supplementary feed. Any kind of grain will answer this purpose. Probably the best feed is oats, and if it is sheaf oats better still. In Texas some of the large goat raisers feed cotton seed by scattering it upon the snow so that goats will have to exercise somewhat in picking it up; besides, the time consumed in picking up the seed thus scattered, insures better mastication.

Cowpea stubble in the autumn, otherwise used for fertilizer only, has proved a satisfactory feed. Cowpea hay, clover hay, and alfalfa hay are all most excellent coarse feeds, and no grain is necessary with feed of this kind to carry the goats through the winter.

In feeding grain care must be taken not to make the supply too liberal, unless the object is to fatten for slaughter. Goats easily become lazy on a plentiful supply of grain and will decline to go out to feed upon the brush. This is an important point, as their hardiness to a large extent is attributed to their feeding upon browse and to the resulting exercise.

To keep goats in good condition the quantity of feed necessary varies according to climate. A fair average would be one-fourth

pound of corn or its equivalent in other grains and $1\frac{1}{4}$ pounds of hay at a ration. If an abundance of winter pasture is available, this ration fed once a day, preferably in the evening, is sufficient. If such pasturage is scant, they should have it twice a day, and on wet, cold, days when kept all day in sheds it should be fed three times or their rations should be made considerably larger.

Sugar-beet pulp has been fed with success. The goats must be taught to eat it, but after once learning they seem not to be able to get enough.

Goats will not eat soiled feed, as they are very fastidious in the matter of cleanliness of feed, and they have no inclination to stand in mud or filth, much less to pick their feed from it.

A running stream in a pasture is valuable, but if this is not present good water from a spring or well should be afforded.

Goats require more salt than sheep, owing to the more astringent character of their food. If loose salt is used, the general custom is to give it once a week on regular days. If rock salt is used, it should be placed where the animals can get to it at any time. Rock salt is preferable, as it can be placed in boxes or troughs raised from the ground, and thus be kept out of the dirt and be of easy access to the goats at any time; and, too, there is no waste and no danger that the animal will eat too much of it.

MARKING.

Several devices for marking goats are in use, but the metal tag in the ear is probably best known. A practice which appears to give satisfaction is to tattoo the numbers into the ear, using indelible ink. It is found that the metal is sometimes pulled out by brush.

BROWSING AND PASTURAGE.

ABILITY TO CLEAR BRUSH LAND.

Goats are browsers by nature, and there is no vegetation they will eat in preference to leaves and twigs of bushes. While this fact would at once establish them as an intolerable nuisance in an orchard or garden or any other place where desirable shrubbery is growing, it also shows that they may be of great value in many localities where it is desirable that underbrush be destroyed. Every leaf and every twig within their reach is greedily eaten, even to most of the bushes and weeds that are considered poisonous to other ruminants, while a remarkably few weeds are passed by. They will desert the finest clover and blue grass for such fare.

The inherent tendency to climb leads them to hillsides and rocky cliffs, and they prefer such situations to any of a level character. Here nature meets their necessities by dwarfing the bushes so they

may be browsed easily; the soil is quickly drained in the event of rain for they do not like wet land; and the stones serve to keep the feet trimmed properly by the wearing process. This is the situation that the goats would choose; but the farmer might choose to turn them into a dense mass of brush and weeds anywhere and they will at once begin to convert it into the most beautiful pasture.

In their efforts to get at the leaves and twigs the goats will stand on their hind legs and strip the saplings to a height of 5 or 6 feet. Often they will strip the bark from young trees and sometimes, too, they will not touch the bark of a single sapling for a while, and then suddenly all of them will go to work and tear the bark off rapidly.

Why the value of goats as brushwood destroyers was not recognized years ago it is difficult to say. Dr. J. R. Standley, of Iowa, is supposed to be the discoverer of this economic use of goats. An article in a consular report on the propensity of milch goats for destroying brush and scrub attracted his attention, and he at once saw that the characteristic which made the goat a nuisance abroad could be put to beneficial use upon his own tract of land, which was useless on account of its dense growth of underbrush. Doctor Standley at once secured a carload of Angoras and turned them upon his land with the most gratifying results. His opinion of goats as brushwood destroyers is given herewith:

Land can be cleared of the worst brush known to this country for a little less than nothing by Angora goats. Some one asks how. Simply this: Angora goats will pay a profit and live on leaves and weeds, leaving the land cleaner and nicer than can be done in any other way. Many persons have the idea that goats bark the trees and in that way kill them. They also think that goats wholly eat the hazel and other small brush. There is nothing in this. Goats are no worse to bark trees of any kind than sheep. The way in which goats kill brush is by continually cropping the leaves, which serve as the lungs of the brush. The continued cropping of the leaves makes the brush, as it were, sick, caused by lack of nourishment. This sickness sinks to the very extremity of the roots, thus preventing sprouting. Any and all kinds of brushes are in this way easily killed. Some kinds of brush and some kinds of stumps are of course much harder to kill than others. Many varieties are entirely killed by one summer's trimming of the leaves. Almost any are killed by two years' trimming. To clear the worst brush do not cut anything that the goats can reach or bend. The tallest or largest is better not cut. All trees and saplings should be cut, and the goats will keep all the sprouts down. If stumps are allowed to sprout one year before the goats are turned in, the sprouts need not be cut. About 200 goats for 40 acres of brush will in two or three years make the land as clean as a garden. If the pasture has only patches of brush, turn in a few goats and it will make more grass for other stock than if the goats were not in. They eat very little grass when they can get leaves. Goats even like weeds better than grass. In clearing brush land in the old way by grub and plow there are always left many eyesores in the way of brushy nooks and bends and steep places which can not be plowed.

There are millions of acres of land in nearly every State in the Union which might be much more than doubled in value by the use of Angora goats at no cost at all. Commence and count the worth of your land, then the fencing, and see if you can afford to leave your brush land so nearly worthless for all time. Then count the cost of grubbing and plowing, if indeed such land is susceptible to the plow. No man can afford to grub and plow



BRUSH LAND "BEFORE GOATING."



BRUSH LAND "AFTER GOATING" TWO YEARS.

brush land in this day and age of the world any more than he can afford to plant a large field of corn without a planter. In hilly or mountainous portions of the country the Angora goat can be made to do a great service in the way of clearing the underbrush, when the land will bring grass after the brush is gone. It would surely be a paying business to buy up large tracts of rough land in the mountain districts, or indeed any brush land in the United States, and clear the brush and set in grass. Afterwards, if the owner liked other stock better, he might dispense with the Angoras. In many places where the country is too bare to furnish sheep with sufficient feed goats will do exceedingly well. In many places where leaves are abundant and there is scarcely any grass, making it impossible to profitably keep sheep, goats will do admirably well.

Upon the recommendation of Doctor Standley, based upon his experience, thousands of goats were taken into Iowa for clearing brush land some time before they were seriously considered elsewhere.

Doctor Standley's experience is but that of many others, and testimonies of the goat's ability as a brushwood destroyer have come from all parts of the country. There is no doubt that the question of brushwood is a serious one in many sections of the United States, there being millions of acres of land covered with brush, ferns, and briars, thus being practically useless for pasturing. There seems to be no more economical way for clearing up this land than by the use of the goat.

In localities where valuable land is completely overgrown by brushwood the goats are considered of more value for the purpose of clearing it than for their mohair and meat. Their value in this respect must be measured by the value of the land which they render cultivable. In Oregon it has been estimated that the average cost of clearing an acre of brush land is \$20; the goats have done the work and boarded themselves. In southern Ohio, Maryland, West Virginia, and Virginia, and in the South also, the cost of clearing an acre is about \$12; the goats do the work for nothing. These animals may require more time than men in clearing the land, but the work is better done, and they enrich the soil from the day they are turned upon it.

If the saplings are too large for the goats to manage, they may be cut down, so that the animals may get at the leaves and twigs at the tops.

As brush must be subdued continuously for two or three years to kill the roots, it is necessary to keep the goats on it for more than one season. Most shrubs will start anew from the roots, and if the land is to be converted into pasture or cultivated the goats should have the run of the wood lot for at least a part of the time for two or three years. In this time a large amount of the richest kind of manure will have been deposited on the land, which aids the grass in its growth.

Almost every kind of vegetation is relished by goats. They are not fond of hickory, alder, and pine, but have been known to eat them greedily at times. In Maryland and Virginia there is a great deal of broom sedge, which will not be touched by other live stock, but goats

consider it a favorite feed. A field of cockleburs was completely destroyed by goats in Texas, according to a report from a breeder in that State. Lantana has proved a curse on valuable land in the Hawaiian Islands, but goats have been known to destroy this shrub also.

The fact must not be overlooked that the brush-destroying habit is common to all kinds of goats. The common goats will do the work as well as the Angoras. The latter are employed for the purpose because they are more plentiful and because there is profit in their progeny for breeding purposes, their mohair, and their meat.

OTHER ADVANTAGES OF BROWSING.

The browsing habit of goats is important in connection with the question of feeding. In some places they obtain enough browse to carry them through the winter. This is especially true in the Southwest, where there is so great an abundance of live oak. If snow is on the ground, or if for other reasons the goats are deprived of opportunities for foraging, the trees are cut down for them. They pass through the winter in good condition with other feed. Wherever they are deprived of opportunities for browsing, they must be fed. Browsing saves feed. As far north as Nevada goats subsist the winter through on sagebrush.

Some persons claim that the animals make a better growth among the bushes than on open pastures, and that the quality of the fleece is much better.

Many correspondents state that it is the browsing of the Angora that gives to the meat the game flavor, thus leading some to name the meat "Angora venison." It is also stated that when deprived of browse and fed on grass and grain the game flavor disappears. There is no reason why this should not be true, for it is a well-known fact that flavor may not only be fed into meat, but into milk and eggs as well.

PRESERVING BRUSH LAND FOR BROWSING.

Up to this point consideration has been given to these goats as a means of clearing land for pasture or for cultivation. There is much brush land in the United States which will support goats, but is good for nothing else. If this is to be devoted to goat raising, it is, of course, not desirable that the brush be entirely exterminated. In this event a goat raiser should have several fenced areas and change the goats from one to the other frequently. They should not be permitted to denude entirely one field before they are transferred to another. It is true, however, that no matter how perfectly a woodland may be cleared of brush it will be covered over again with briars and brush in a few years if constant attention is not given it. It is not difficult to overpasture such land, and if the goats adopt the "peeling" practice *the brush and trees will have greater difficulty in recovering.*

OBJECTIONS TO SOME BRUSHWOOD.

The statement has been reiterated over and over by the newspapers in mentioning the spread of the Angora goat industry, that these goats will eat all kinds of poisonous plants without any harmful results. While there is much evidence pointing to this conclusion, it ought not to be taken as a settled fact. If experiments were undertaken it might be shown that a plant which is poisonous to sheep or cattle is also injurious to goats. It is observed that goats feed upon brushwood by snipping off a leaf here and there—from a pine here and a cedar there, a grass blade here and a weed top there, and so on; they do not, like the sheep or cow, eat a weed entirely or strip a bush clean before passing on. The result is that the goat's stomach is filled with a great variety of food and not much of any one kind. If by chance a few poisonous leaves are eaten, they are probably neutralized by the large quantity of other food eaten.

Upon a farm in Pennsylvania there was a patch of laurel where goats had passed it by during the whole season. This was evidence that they knew it was not good for them. Later in the season several hundred goats were turned into that same pasture after a long journey and when they were very hungry. The laurel patch was the only green food in sight and they ate of it greedily. The next morning found 300 of them very sick and 50 dead. What had proved harmless to the goats that had been there when there was an abundance of other feed proved exceedingly poisonous to the hungry newcomers.

While it is possible that goats may not eat laurel to such an extent as to be injurious if placed in a pasture where it is growing with other browse, it can not be considered a safe practice. The owner of the Pennsylvania farm referred to found it to be a short job and not expensive to "snake" out his laurel patches with a team and log chain. So brushwood need not be abandoned because there are patches of laurel upon it.

The laurel best known is the narrow-leaf variety (*Kalmia angustifolia*). According to V. K. Chesnut^a this species "is abundant in the northeastern section of the United States, where it is also known as sheep laurel and lambkill. The leaves contain andromedotoxin, and sheep and calves are quite frequently poisoned by eating them."

The greenbrier, which appears to have a wide distribution in the United States, is an enemy to goat raising; not that it is poisonous, but because of its physical character. It is a climbing shrub, very wiry, and well covered with very hard and tenacious thorns. They grow in clumps and to great length, and preferably on lowland near creeks or ponds. It is a very easy matter for these thorns to catch in the fleece and hold the animal fast until it dies. No goat has strength

^a Fifteenth Annual Report, Bureau of Animal Industry, 1898, p. 411.

sufficient to break the shrub, and the thorns do not give way. These shrubs should be cut down with a brush scythe and burned before goats are permitted to go among them. Where goats have had access to greenbriers immediately after shearing, when there is no fleece to catch upon the thorns, they have destroyed the briers by eating the leaves and by girdling.

It is probable that large blackberry briers may be objectionable for the same reason, but ordinarily goats will destroy them without much difficulty. If they have an opportunity to get at any of these briers as they are putting out in the spring, they will not permit them to mature.

It must be understood that goats can not do very much toward destroying trees after they have reached the sapling stage of growth.

GOATS AS GRAZERS.

While it is true that goats are browsers by nature, they will subsist nicely on grass. Several successful breeders believe that goats fed on grass will produce a finer and heavier fleece of mohair, with less wax and gum, and that it will have more luster than if the animal feeds on browse.

Considerable interest has been manifested in the Angora industry in those localities where browse is not available and where grass and weeds form the only pasturage. A great many inquiries of this character have come to the Bureau, and the Bureau, in turn, has referred the matter to the breeders of the country. The replies received have been numerous, and show a difference of opinion. The predominant opinion, however, seems to be that the goats thrive best under the conditions most nearly like those of their original home. It is certainly the best argument to say that goats prefer any kind of browse to the most nutritious of grasses, which is true, and therefore browse is better for them than grass. While the more economical conditions obtain where there is an abundance of browse, it is not definitely settled that the goats will not thrive well on common pasture grasses. It is the opinion of the writer that this question is still an open one, as some successful breeders have had goats on the grass range for thirty years. From the standpoint of the goats' preference there is no question that browse is the better food, and this in itself is a forceful argument.

There is always expense in connection with pasture grasses, but there is little or none with browse. One of the chief reasons why goats are receiving so much consideration at this time is that they are practically inexpensive feeders, and so all items of expense must be figured on if profit is to result. Pasturage, unlike browse, is not available all the year through. Therefore in prairie locations feeding in winter is a necessity.

PASTURING WITH OTHER STOCK.

So far as the goats themselves are concerned, they may be kept in the pastures where there are sheep, cattle, and horses. Their presence is in no way obnoxious to any of these animals. A few of them in a flock of sheep are a protection against dogs. However, it is not best for the goats that they be kept in pastures with horses. This is especially important if there are kids, as the horses have a habit of playfully chasing any animal that is not large enough to defend itself, and they are apt to strike the kids. It is also important that the kids should not be in pasture with hogs, which are liable to eat them.

NUMBER OF GOATS TO AN ACRE.

Questions are frequently asked with reference to the number of goats to an acre. The number will depend, first, upon the object in pasturing on brush land, whether it is to kill the brush or to use it as a permanent pasture for the goats; and, second, upon the quantity of feed obtainable. While one acre might be as dense as a jungle, another might have small thickets alternating with grass plats. Thus it will be seen that a definite answer can not be given to such questions.

MOHAIR.

DESCRIPTION.

The word "mohair" is the technical and commercial name for the fleece of the Angora goat, which is used in the manufacture of fabrics. The word comes to us, through the old French "mohere," from the Arabic "mukhayyar," meaning goat's-hair cloth.

The fleece upon the goat is pure white, is exceedingly lustrous, and grows to an average length of 10 inches annually. It hangs in beautiful wavy curls, or ringlets, from all parts of the body, if the animal is of the best breeding. The average annual production of mohair is about 4 pounds a head. The grade of the goat has much to do with the weight of the fleece. The first cross of an Angora buck upon a common doe gives but a small amount of mohair, but the increase in quantity is noticeable as the crosses become higher.

All mohair has a luster peculiarly its own, but this is much more pronounced in some fleeces than in others. That having the higher luster, other qualities being equal, commands the better price. A fleece of low luster indicates a goat under influence of adverse conditions—as poor breeding, poor feeding, or sickness. The uninformed often express the opinion that this luster is due to oil in the fleece, but this is erroneous. Whatever oil there may be in mohair is inside the individual hairs, and not on the outside, as in the case of wool. A mohair fleece may be washed, then scoured, and then steamed, dyed, and worked up into fabrics after reaching the mills, but none of these

processes removes any of the luster; indeed, all of them operate simply to intensify it.

The properties of this fiber which render it desirable are length, fineness, luster, strength, elasticity, and specific gravity, and these are relatively desirable in about the order given. There is no difficulty in securing length and strength, but the other properties must come by the most painstaking care by breeding. Having length, strength, and luster, the manufacturer wants the fiber as fine as can be bred. The length of the clip is the quality that gives to mohair its relative value. The manufacturers desire a long fiber, very fine, and strong. While there are uses for coarse grades of good length, the price is not so good as for the finer grades. The latter are used principally in the manufacture of plushes, and the coarser grades in dress goods, coat linings, etc. Feeding has much to do with the length and strength of mohair as well as with the weight of the fleece. The colder climates also increase the fineness and add to the weight.

The following table, which is compiled from a "Report of examination of wools," etc., by Dr. William McMurtrie, and published by the Department of Agriculture in 1886, gives a very interesting comparison between length, fineness, strain, and stretch of mohair and commercial grades of wool:

A comparison of mohair and wool fibers.

Description.	Length.	Fineness.		Strain.		Stretch.	
	Inches.	Centi-millimeters.	Thousandths of inch.	Grams.	Grains.	Millimeters.	Per cent.
Mohair (average of 480 tests) ..	6.91	3.157	1.2429	19.12	295.11	10.80	26.50
Commercial wools (average of 1,410 tests)	2.62	2.118	.8352	7.01	108.79	5.02	25.11

It will be observed that mohair is not equal to wool in fineness, but in strain there is a difference much greater than would be suggested by the larger fiber. The average wool fiber in these tests stood a strain of 108.79 grains, while the average mohair fiber stood a strain of 295.11 grains. This is a difference of 186.32 grains—much more than double the strength of wool. It is to this strength of fiber that the great durability of mohair goods is ascribed. In stretching quality there is but a slight difference between mohair and wool. Dr. McMurtrie makes the point in discussing wools that the individual fibers may be variable in size, a condition brought about, it is supposed, by sudden changes in weather or feed, or by ill health.

Dr. W. C. Bailey states that the Koniah goat of Asia Minor bears a brownish-colored fleece and the mohair is sold on the market as "Koniah mohair." As there is but a slight demand for this hair, these goats are being interbred with the white Angoras. It is by no

means unusual, according to Doctor Bailey, for colored goats to be seen in Asia Minor—such as black, blue, brown, or red. Occasionally a colored kid is dropped in this country.

CONDITIONS INFLUENCING QUALITY.

Any woolgrower knows that feed and care have a very great influence upon the weight and fineness of the fleece. The same is applicable to mohair growing as well. If goats are exposed to sudden changes of weather, the effect is shown in the fleece. Under adverse conditions an individual mohair fiber will show contractions, which greatly reduce its "stretch" and "strain."

John S. Harris, one of the early breeders of Angora goats, and who is a man of good observation and rare judgment, says that the finest and evenest mohair is from goats which feed upon grass. He says that brush is "pie" to goats, and a little pie will do no harm; but all pie is not good. While this is contrary to the opinion of most breeders, the experience of one who has so long been raising goats should not be hastily cast aside.

Schreiner says: "If goats are to produce the best fleeces they are capable of they must be maintained in uninterrupted good condition. They must have a variety of food, principally shrubs and aromatic plants, and lead an active life; they must, if possible, have running water to drink and be kept free from dust; they must not be kraaled (shedded) except when absolutely necessary; they must have clean sleeping places, and must not be crowded together."

In some sections of our country, where the climate is dry and the soil distinctly alkaline, the natural animal yolk disappears from the mohair, leaving it dry, frowsy, and harsh. The dust of the fine alkali soil penetrates the fleece, so that much of the mohair grown in those sections is loaded with it, amounting in some instances to 40 per cent in weight.

If an Angora goat is of most profit in clearing land of brush (as is the case in some localities), his work will be done just as well if he produces at the same time a first-class fleece; thus he may become more valuable. There is no reason why Angoras should have the preference for such work over the common goats, except that they may be profitable in other respects at the same time; therefore the better the fleece produced while destroying brush, the greater the value of the goats.

As an animal grows older the fiber becomes coarser. The best fiber grows upon goats of the best blood, and among these that upon kids, yearling wethers, and does, in the order named, is preferred. The best fiber is usually very curly, or, rather, in ringlets, but not kinky. It loses its curl and becomes thinner, coarser, and straighter as the animal grows older. A fiber of the best quality is shown on the

left of Plate 8. It will be noticed by careful examination of this illustration that the samples become less curly as arranged from left to right. The last sample in the illustration is from an old buck, the one next to it from an old doe, while the two samples on the left are from kids.

WEIGHT AND LENGTH OF FLEECE.

The weight of the fleece is always a subject of inquiry and is a difficult question to answer, because of the controlling circumstances—such as climate, feed, care, and above all, the degree of Angora blood in the animal. Perhaps at this time the average weight of the fleece in the United States would be between 3 and 5 pounds an animal and the length would average about 8 inches. There are, of course, individual goats of high breeding that will shear 8 to 12 pounds and carry a fleece 12 to 18 inches long. When shearing is done twice a year, as is the case in the southern part of the country, the fiber will necessarily be shorter.

SHEARING.

In Texas, New Mexico, Arizona, and sometimes in California, shearing is done twice a year—in the months of March or April and in September or October. The reasons are that, owing to the warm climate, the fleece will often shed in the fall if not clipped. There are instances in these localities where goats carry their fleece through the year, but all breeders, except in some parts of California, report the practice of shearing twice a year. In the other parts of the country shearing is done but once a year, and that in the months of March or April. The rule for shearing time does not depend so much upon the calendar as upon the condition of the fleece. It should not be delayed until the fiber begins to shed, as then the oil will begin to go back into the body of the animal, the mohair thus losing its life and luster.

As to the relative values of the semiannual and annual fleeces, there does not seem to be much difference of opinion. The semiannual fiber is shorter and therefore less desirable for fabricating, and the price is not so high as for that of the annual fleece. It is generally agreed that the two shearings combined weigh a little more than the annual shearing, but probably the increase does not average more than a quarter of a pound. However, some who have practiced it report that the gain is not equal to the cost of the second shearing, and that shearing twice a year is done from necessity rather than from the standpoint of profit.

It is well to bear in mind that the mohair manufacturers prefer long hair, above 6 inches, and that they have not yet been able to secure all this staple they need.

The use of clipping machines, largely employed among sheep raisers, is coming more and more into general use among goat raisers.

SAMPLES OF MOHAIR.



There are those, however, who still prefer hand shears. The machines are more rapid than hand work, and the results are more satisfactory. The cutting of the skin is easily avoided in reasonably careful hands, while it requires extreme care with hand shears to prevent cutting.

Of course the goat raiser will consider the relative cost of shearing with machines and by hand before he will purchase a machine. The decision will probably depend upon the number of goats. The cost of shearing is about 4 cents a head in the South and from 7 to 10 cents in the North. In the Southwest there are Mexicans who follow the profession of shearing sheep and goats; these usually receive 2 cents a head with their board. Many of them will shear 85 or 90 a day, the average of all being about 60. Any man who can shear sheep can shear goats. If shearing is done by hand, a short-bladed shear should be used in order to avoid cutting the hair twice. Another objection

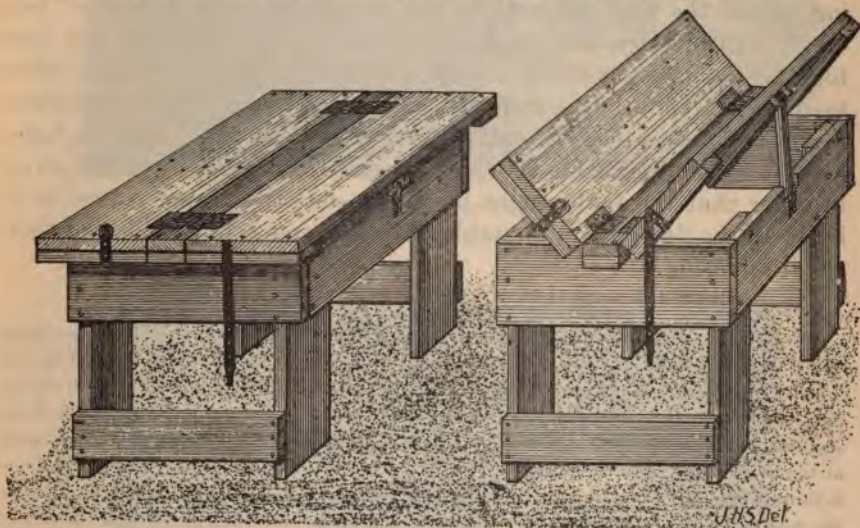


FIG. 2.—Combination shearing trough and table.

to hand shearing is that there is often double cutting of the hair. The result is a shortening of the fiber and an increased amount of noilage.

The power machines may operate a number of shears, all of which are connected with the main driving shaft. The same machine with one pair of shears may be operated by hand power. Such machines are not expensive and goat men may find it advantageous to use them.

During the World's Fair at St. Louis in 1904 a power machine was chosen in the shearing contest, and a goat was sheared in the very short time of three minutes and three and one-half seconds.

Goats are not so gentle in the hands of the shearer as sheep, and many men, especially among beginners in the industry, are anxious to know how best to handle them during the operation of shearing.

The late F. W. Ludlow, of Lake Valley, N. Mex., devised a shearing table which has proved to be of great service. It is a collapsible trough, or combination table and trough. Plate 9, fig. 2, shows this table in use, while fig. 2 (p. 51) in the text is an outline drawing, which will show more clearly than the photograph how it can be made. It will be noticed that it is very simple, and it is equally suited to hand or machine shearing.

This table is first used in the shape of a trough. The goat is placed in it on its back and held down by means of a strap across its throat. While in this position all the underparts, sides, and legs may be worked upon. In machine shearing it is a good plan to start at the brisket and shear all the belly as far back as possible; then shear the front legs and neck; then start at the hocks and shear up the hind legs and along the sides to the point of beginning. After shearing one of the sides allowed by the trough, the goat is tied—"hog tied," to use a western expression—that is, all four feet are tied together. The sides of the trough are now dropped, forming a table upon which to finish the operation. The illustration shows that there is now free access from the tail to the head, and the goat remains helpless. In the illustration the fleece already cut has been pulled away in order that the table might be shown, but the proper course is to leave all the fleece upon the table until the goat is liberated, and then roll it up inside out.

Mr. Ludlow's description of this table is given herewith:

The table is simple in construction. It is about 22 inches high, 2 feet 10 inches long, and 21 inches wide. The top is composed of two 9-inch sides, which are hinged to the 3-inch centerpiece. On the lower side of these movable flaps is a narrow piece 8 inches long, which catches on the framework of the table when the sides are lifted and holds them stationary. When the sides are elevated, the top of the table forms a trough 3 inches wide at the bottom and possibly a foot wide at the top. Into this trough the goat to be shorn is thrown feet up. A small strap, which hangs from the end of one of the sides, is run over the goat's neck and fastened to the other side. The goat's head is hanging over the end of the table and the strap prevents it getting free. The belly and legs are then shorn. The legs of the goat are then tied together, the strap removed from the neck, and the sides of the table dropped, so that one has a plane surface on which to shear the rest of the animal. An untrained man can shear 100 goats a day with a shearing machine and such a table.

SHEDDING.

There seems to be a difference of opinion as to whether Angora goats shed their hair. Dr. W. C. Bailey, in his book on "Practical Angora Goat Raising," is quite positive that they do shed. Schreiner also writes of goats shedding their hair if they are not sheared at the proper time, and Col. William L. Black, in his book, "A New Industry," quotes a number of breeders who speak of Angoras shedding.

There is probably no doubt that there is a large number of Angoras



FIG. 1.—SHEARING GOATS BY MACHINERY.

One goat has been shorn, the other is under the hands of the shearer.



FIG. 2.—SHEARING GOAT BY HAND.

of good breeding which do not shed, but on the other hand, judging from the expressions of experienced breeders, there are many goats which do shed if not sheared at the proper time.

CARE OF FLEECES.

It may not be known to goat breeders generally that the objection to any foreign fibers in mohair is the same as that which holds against kemp, namely, they will not take the mohair dyes. Therefore, if every particle of such foreign substance is not removed before going into the fabric, it shows in a prominent and unpleasant manner when the article is dyed, and necessarily cheapens it if it can not be buried out. For this reason mention is made here of the practice, quite general in this country, of tying fleeces with twine. In removing this twine at the mills it is almost impossible to prevent portions of it from adhering to the fleece, and it must be removed so far as possible by the most painstaking care. Fleeces from Turkey and Cape Colony are not tied, but simply rolled up inside out, and this is the condition in which the mills desire to receive them.

Few goat breeders wash their goats before shearing, and if the animals have been well cared for during the winter and early spring washing is not necessary. The mohair manufacturers will not pay as much for dirty fleeces, and the breeder will find it to his advantage to ship his mohair in as clean a condition as possible.

The breeder should also understand that if the manufacturer has to pick burs, seeds, straw, or sticks out of the mohair, he necessarily will charge for the time consumed and the damage done to the fleece, and in this way the price of the clip will be considerably lowered. It may take time for the grower to clean the fleeces, before the animals are sheared, but certainly the higher price obtained will amply compensate him.

Colored fleeces, tag locks, mohair that is clotted, and that which is kempy and dirty should be packed separately.

As kid hair is usually the finest, it should be packed by itself; the doe hair and that from the wethers, if the hair is of about the same quality, may be packed together, and should be separated from coarser fleeces. The difference in price obtained for hair that has had this small attempt at sorting will be considerable and well worth the effort.

The operation of shearing should be done in a building free from straw and dirt, which might adhere to the fleece after it drops from the goat. The fleece should then be rolled up inside out and packed in the sack without being tied in any way.

The very short hair, mane, kemp, and the hair that has been cut twice in shearing are, together, called "noils," and this must all be

combed out before the mohair can be spun. The noilage in Turkish mohair is only 15 to 20 per cent. In our domestic product it runs as high as 40 per cent. Noils are worth from 20 to 25 cents a pound.

PRESENCE OF KEMP IN MOHAIR.

Besides the mohair there grows upon the Angora goat coarse, chalky, white, stiff, straight hair, varying in length from half an inch to 4 inches, technically known as "kemp." It is generally believed that kemp is a relic of the common goat blood in the Angora, as it is a matter of history that the Angora flocks of the United States, as well as those of Asia Minor and South Africa, have been largely increased by crossing upon does of common blood. This argument seems plausible for two reasons: First, there is a certainty that there are no Angoras now in existence which are absolutely purebred, on account of crossing with common Kurd goats practiced many years ago by Turkish breeders; second, it is noticeable in building up a flock by crossing upon common goats that the kemp gradually grows less with each succeeding cross. That point has not yet been reached, however, where it can be said that a strain has been produced which has no kemp whatever, although a few breeders in this country and in South Africa appear to have very nearly reached that desirable result. This is the principal end to which breeders should lend their best efforts at this time. It is the most difficult quality to obtain. Length, strength, fineness, and luster may all respond readily to the intelligence of the breeder, but kemp is stubborn. The hope is confidently expressed by the best breeders that a strain of Angora goats will yet be produced which will be entirely free from kemp.

WHY KEMP IS OBJECTIONABLE.

The reason why kemp is objectionable is that it will not take the dyes used for mohair; the only effect of the dyes is slightly to discolor the kemp. There are dyes, it is true, which act upon kemp, but they have no effect upon mohair; and the best efforts put forth have not yet resulted in a mixture of dyes that will act satisfactorily upon both mohair and kemp at the same time. The only solution, therefore, is to remove kemp from fleeces which enter into the manufacture of fabrics in which it is undesirable.

Kemp appears in its worst phase in plushes, where every individual hair shows prominently. Its presence here is much more pronounced than when in the fleece, where it is nearly of the same color as the mohair. It is therefore of great importance that this objectionable substance should be removed from the fleeces. If any kemp should escape the eye and be woven into the plush fabric it would not be discovered until the fabric came from the dye, for it must be remembered that mohair plushes are woven "in the white," and afterwards (per-

haps several months or a year) are dyed according to instructions to fill orders. Kemp, at this stage of the process, becomes an expensive proposition, for skillful hands must burl out every fiber of it as well as every other bit of foreign substance. In the cheaper plushes, such as are largely used in street cars, there is a considerable quantity of kemp. Much of this material may also be used without detriment in the manufacture of rugs.

The problem of the mohair manufacturer is the same as that of the mohair grower—how to get rid of kemp; and the burden of his meditations is to devise some sort of machinery that will do the work perfectly. American ingenuity has so far failed to invent such a machine; and so the manufacturer finds it necessary to call upon the breeder to produce mohair without kemp. The solution of the problem, therefore, appears to be with the breeder rather than the manufacturer.

But the fact remains that the mills must get rid of kemp in some way, and the device which they use for the purpose is a machine which combs it out; but while the comb is removing the kemp it removes at the same time every mohair fiber of equal length with the kemp. This means that if the mohair going into this comb has kemp 3 inches long, all mohair fibers up to 3 inches in length must go out with it. The result is heavy loss. True, there is a use for this mixture of kemp and short mohair, as heretofore stated, in the manufacture of cheap goods, such as horse blankets and filling for carpets, and also for stuffing saddles. From the breeder's standpoint this residue from the combs will be considered as a loss, and he must figure it as wastage. This wastage runs from 5 to 40 per cent.

Mr. George B. Goodall, of Sanford, Me., is quoted as saying: "A majority of the mohair growers in this country little realize how much kemp has to do in keeping down values of their clips. If they could spend a few hours in our sorting and combing rooms the lesson learned would be of great value to them—more than could be obtained by reading. In watching the combs at work they would notice some making only 5, 10, or 12 per cent of noil or waste, while others will be taking out 30 or 40 per cent. Ask the comber the reason of this, and he will reply that one lot has a much larger amount of kemp than the other. One fiber of kemp takes out five or six good fibers which should go into the yarn."

DURABILITY.

The durability of mohair and mohair manufactures is well known to those who are familiar with their use. Statements which to some may seem incredible are on record, but there is no good reason to doubt their accuracy. S. Holmes Pegler, author of the English work, "The Book of the Goat," states that in 1881 the Duke of Wellington

imported a half dozen Angoras from the Cape, and many of the clothes worn by the duke were from the fleeces of these goats, and he continues: "I myself possess an overcoat cut from the same stuff, presented to me by His Grace, which promises to be everlasting as regards wear." Dr. James B. Davis, who, as hereinbefore stated, first introduced Angoras into the United States, says in an article which was published in the Annual Report (Agriculture) of the Commissioner of Patents for 1853:^a "I have socks which I have worn for six years and are yet perfectly sound." A friend of the writer states that he has had one mohair rug at his office door for twelve years, and it does not yet show much wear, while the luster and color remain as distinct as when new. Ladies who have worn mohair crepons and brilliantines are all aware of the wonderful durability of this fiber.

Strange as it may appear upon first thought, it is the durability of mohair dress goods that has prevented their more extensive use heretofore. The first cost being somewhat high, they have not generally been worn by people of limited means whose principal aim is durability in the purchase of clothing. They have been subject to the caprices of fashion, being "all the style" one year and "out of style" the next. This has naturally restricted their use largely to that class of people who could afford to discard them before wearing them out.

Even though the first cost of these goods may be high, their use would prove economical for that class of people who desire good quality and good appearance without affecting the highest degree of fashion. They will preserve their color to the last and the luster will never disappear.

PRICES.

Mohair prices have a wide range and are influenced to some extent by prevailing fashions. The demand for mohair of good quality has been steady and constant during the past few years, and so many staple articles are now manufactured from it that fleeces of good quality, clean, and uniform in length, find a ready sale. Mohair that is dirty, kempy, and short will bring as low as 7 cents a pound. During the last year (1905) fancy prices have been paid for mohair over 12 inches in length by manufacturers of specialties, such as wigs, flowers, hair nets, etc. The average price of mohair of one year's growth for 1904 and 1905 was 34 cents a pound.

The following instances are given of remarkable mohair yields and prices: Among the Angora goats exhibited at the Louisiana Purchase Exposition in October, 1904, were two goats which, because of the long fleeces that they carried, attracted more attention than any others

^a At this time agricultural investigations were in charge of the agricultural division of the Patent Office in the Department of the Interior. The Department of Agriculture was established in 1862.

of the prize winners. One of these was a doe owned by Mrs. M. Armer, of New Mexico; the other, Kingston Lad, was the property of Tom Wedgwood, also of New Mexico.

Mrs. Armer's doe sheared 14 pounds. The length of the staple is not stated, but the longest of it was about 18 inches. The mohair was sent to a purchaser in New York city who fixes his own price upon long mohair. He buys all he can find in this country and imports largely besides. He uses the hair in the manufacture of various things, such as wigs, switches, nets, ornaments, flowers, etc. The following was his payment to Mrs. Armer:

2 pounds, at \$5.....	\$10
7 pounds, at \$4.....	28
5 pounds, at \$1.....	5
Total.....	43

Mr. Wedgwood's buck sheared 16 pounds. Ten pounds of this he sold to the gentleman already referred to at \$5 a pound. The owner says he gave away ringlets from the buck at St. Louis to the amount of 2 pounds at least. Most of the fleece was over 20 inches long.

In this connection it is interesting to note that a considerable number of persons in various parts of the country have sold whatever very long mohair they raised for very high prices—all of it to one man. For instance, William Riddell & Sons, of Oregon, sold 25 pounds for \$42, as follows:

3 pounds, at \$3.....	\$9.00
5 pounds, at \$2.....	10.00
• 15 pounds, at \$1.50.....	22.50
2 pounds, at 25 cents (waste).....	.50
Total.....	42.00

The Northern Angora Goat and Live Stock Company, of Montana, recently received from the dealer in long mohair \$6.50 a pound for 42 pounds, a total of \$273. This is the highest price on record and indicates that the mohair was remarkably long and fine.

It seems that there would be a limited demand for mohair for the purposes for which this very long staple is used. So long as there is a demand for a particular quality of mohair at such great prices the breeders will be wise if they endeavor to supply it.

MANUFACTURES.

The first striking feature of mohair manufactures is their great beauty. The luster of the hair, which is so pronounced even while it grows upon the goat, remains in the manufactured goods, and no amount of washing and no character of dye will remove it. It aids the dyes to show their colors more effectively and imparts to the goods

the pleasing property of changing shades in shifting lights, which is a feature quite characteristic of silk goods.

A second feature of importance is that the dyes are usually fast, and however much such goods may be exposed to the elements they will not fade. In the best mills fugitive dyes are not used except when an order is received to match a sample which has been treated with such dyes; for a fugitive dye can not be matched by a fast one, nor can a fast dye serve for a fugitive one.

The durability of mohair goods has been discussed in connection with the durability of the fiber composing them. It is a characteristic that ought to make their use economical in many ways. This should be the case especially with dress goods and other wearing apparel.

Mohair manufactures already have a very extensive use, but they appear in the stores under so many trade names that only a few people, comparatively, know that they are the product of the Angora fleece. These manufactures are so varied and the fiber adapted to so many things which are now made of wool or cotton that no attempt will be made here to give a complete list of them, but a recital of some of the principal uses of mohair goods will be made in order that it may become generally known how extensive is their use at the present time, and some idea formed of the possibility of extending the use of mohair to other lines of manufacture.

By far the most important product of mohair manufacture is plushes. It is a fact not generally known that practically all of the plushes used in railroad passenger cars are made of mohair; so also are the plushes used in street cars.

By taking the figures given in the report of the Interstate Commerce Commission for 1904 and adding the number of cars belonging to private companies not covered by that report, it appears that there are in service on the railroads of the United States 18,678 first-class passenger cars, 3,778 second-class cars, 5,072 combination cars, 1,182 parlor cars, and 3,436 sleeping cars. Mohair plush is used in upholstering practically all of these cars. The passenger cars require approximately 120 yards of plush for each car, the parlor cars 220 yards each, and the sleeping cars 167 yards each, making an estimated total of 4,184,492 yards used on the cars in service. Add to this the amount used in reupholstering cars, that used in private cars, street cars, omnibuses, etc., for which there is no basis for an estimate, and it will be seen that the use of mohair for such purposes is enormous.

Besides the car plushes, which are usually plain, large quantities of frieze and crush plushes are used in upholstering furniture. The designs for the frieze plushes are limited only by the ingenuity of man. The skill of the fabricator is so well developed that the threads forming the designs are in loops and of different color, yet the whole is



HAND-PAINTED MOHAIR PLUSH.



HAND-PAINTED MOHAIR PLUSH.

Plate 11.

27 B A I.

MOHAIR FRIEZE PLOSH



MOHAIR FRIEZE PLUSH.

R. No. 27 B A. I

Plate II



MOHAIR FRIEZE PLUSH

woven at one time "in the white" and afterwards colored in the same dye. The crush plushes are very handsome, showing to best advantage the effects of varying lights upon solid colors. This kind is largely utilized in upholstering armchairs, but finds large use also in other kinds of furniture.

The carriage robes, couch covers, sofa-pillow covers, and rugs are distinguished by their high pile and rich coloring. The pile upon the carriage robes and sofa-pillow covers is about half an inch high. The robes sometimes have the pile on one side only, but many are made with the pile on both sides. The coloring is most exquisite, as is true of the sofa-pillow covers and couch covers. These colors are printed on by hand after the pieces are woven, and are rendered indelible by long steaming. Rugs necessarily require more modest covering, but all the richness of subdued colors and luster remain to make them a distinctly beautiful as well as useful ornament. These goods can hardly fail to attract attention and advance in favor.

Most of the so-called astrakhan now in use is made of mohair. It has all the beauty of the real article, is much more durable, and will never change its shade in sunlight or air.

This Bureau has been furnished with samples of plain mohair dress goods (brilliantines), as well as mohair crepons, which are well known for their durability. There is no other kind of cloth which is more easily cleaned or which retains its newness for a longer period. For this reason brilliantines are especially popular for traveling dresses.

It would be very difficult to enumerate the many ways that mohair might be used in manufactures. Besides plushes, which form the principal item, there may be mentioned dress goods of various designs, coats and coat linings, table covers, etc., which are already on the market. There is a growing demand for it in cotton-seed oil manufacture as press cloths, because it stands the strain of pressing particularly well. A suggestion has recently been made that mohair could be manufactured into tent and sailcloth and rain coats, having as its qualifications durability, lightness in weight, and immunity from molding. Mohair cloth will not only turn water, but will hold water like a skin if the water is not beaten through it. A piece of brilliantine in the form of a bag and holding a glassful of water hung all day in this office and not a drop passed through it during that time. Mr. John S. Harris informed the writer that he possessed mohair cloth 40 years of age which would hold water in the same manner. Tent and sail cloths would necessarily be heavier and be even more effective in turning water. It is argued that the extra cost of this kind of cloth for these purposes is more than compensated for in the matter of durability and lightness of weight.

Practically all the plush imported into this country prior to 1881 came from France and Germany. In that year Mr. George B. Goodall

of Sanford, Me., began experimenting in the manufacture of plush. His company started with but one loom (now they have about two hundred), and it was many weeks before a piece of plush was produced so satisfactory as to be termed perfect.

At the present time there is a number of firms engaged in this industry, and they consume not only all of the domestic product, but over a million pounds of imported mohair annually.

The exhibits of mohair manufactures at the second annual exhibition of the American Angora Goat Breeders' Association in 1901, at Kansas City, Mo., were employed as an illustration, showing how different grades of mohair were used in manufactured articles. This convinced the breeders, as nothing else could, of the necessity for better mohair, and the result of the object lesson has been a decided improvement in the quality of the hair.

Mr. George G. Emery, the mohair expert of the Sanford Mills, Sanford, Me., went to Turkey in the summer of 1903 to purchase mohair. Constantinople being the center of the trade in Turkey, he proceeded to that city and made his selections from about 10,000 to 15,000 bales. Just how much mohair was stored in that city he was unable to ascertain, as no account is taken of the bulk. The merchants would not accept checks in payment for the hair, but insisted on being paid in cash counted out before their eyes.

Mr. Emery took with him three American fleeces, one from a shipment from New Mexico, another from Montana, and the third from Oregon. He showed them to a few of the large dealers, who frankly said that they did not believe the hair was grown in America, but was Turkish hair. Mr. Emery states: "The more I see of Turkish mohair the better opinion I have of the domestic."

OTHER PRODUCTS AND USES.

SKINS.

The skin of the Angora is of a more delicate texture than that of the common goat, and consequently is not suitable for shoe leather. The Angora skin will not bring as high a price in the market as the common skin on this account.

The skin should be removed from the carcass of the Angora immediately after death, as decomposition sets in very quickly and causes the hair to "slip."

The skins of the Angoras, if taken when the hair is about 4 inches long, make very handsome rugs. The hair retains its original luster, and may be used in the natural white or dyed any color desired. The pure white ones are more generally preferred. There is a demand for Angora rugs in the United States which so far has not been supplied by domestic production. These rugs can be purchased at prices ranging from \$4 to \$8.

Another article of manufacture from the skins is the carriage robe, rivaling in beauty and durability the buffalo robe, which is no longer a factor in the market. They are not expensive when the demand for skins is considered, and may be purchased for about \$20. The smaller skins of the does and wethers and the kid skins find a use as robes for baby carriages and are exceedingly attractive in their brilliant white.

These skins are used largely in the manufacture of children's muffs and as trimmings for coats and capes. The finest kid fleeces adorn the collar and border of some of the ladies' opera cloaks. In the stores they are sold often under some peculiar name which does not inform the purchaser that they are ornamented with the hair of the Angora goat, and so thousands of such articles are worn by people who are unaware of the true name of their "furs."

Skins having fleeces are admitted free of duty, but a tariff rate of 12 cents a pound is placed on imported hair and a tariff of a varying schedule is placed upon manufactured mohair.

Importations are considerable, as large numbers of the skins are in use, and the domestic production is limited.

MILK.

The Angora is not primarily a milch goat, and is not often employed for that purpose. The information at hand indicates that the quantity of milk given by an Angora doe is uncertain, and only in exceptional cases does the amount approach that given by the established breeds of milch goats. Some of the records of the earlier importations of Angoras into the United States show that some of them were milked with success. At this time, however, they are not recommended as milch goats; they are more useful in other lines. It is stated upon the authority of some of the oldest breeders in the country that the likelihood of finding a good milch goat among Angora grades diminishes as the breeding of the goat is improved. The milking qualities evidently come from the side of the short-haired goats.

PROTECTION FOR SHEEP.

There is very little complaint heard from breeders of Angora goats concerning the ravages of dogs, while sheep raisers have always to recognize dogs as foes. Bucks can be trained to fight dogs, and thus be a protection to sheep. A few goats will stay with a flock of sheep, but if there are many of them they will be apt to separate themselves.

ENRICHMENT OF LAND.

The droppings of sheep and goats are about equal in value as a fertilizer, and it is certain that the goat produces as much as the sheep. There is no better fertilizer for fruit trees and lawns than goat or sheep manure.

Mention has already been made of the value of the droppings of goats upon land that has been cleared of brushwood. If goats are kept upon land for a year or more, the benefit derived from the manure will be very considerable, not only upon land that has been cleared of brush, but also upon cleared land overgrown with weeds.

THE MEAT.

As far back as Abraham's day we read of goats being used for meat, and this, too, when there were many cattle and sheep. There is a decided prejudice against the use of goats' meat among persons who are ignorant of its qualities. Breeders who pasture their goats upon grass as well as upon browse, and then finish their fattening with grain, produce a meat so nearly like the best lamb that it requires an expert to detect the difference. These people use the term "Angora mutton."

In other instances, where the animal is fattened by browse alone there is imparted to the meat a decided game flavor, which may be intensified or reduced by the character of the browse. People who use the meat under these conditions call it "Angora venison."

In building up a flock of Angoras from common goats comparatively few bucks should be retained for breeding purposes. They should be castrated early. The great majority of these wethers, especially if they are of the first or second cross, do not produce sufficient mohair of good quality to warrant flock raisers in keeping them. These should be converted into meat as soon as large enough. Those wethers and does which produce a fair quality of mohair may be retained for that purpose for a few years and then killed for meat. They are not, however, so good for this purpose as the younger animals.

In Cape Colony it is said that the old does are slaughtered to furnish meat for farm hands and young wethers are sold to butchers in the town. In California many miners purchase Angora wethers in preference to sheep wethers for salting down for winter use, because, as they state, the Angora contains less fat, is more easily kept, and is just as palatable.

One of the first questions to be considered by a man who is about to embark in stock raising of any kind is the market for his surplus. This question is first because it is the principal one and all-important. The one who proposes to begin with a flock of thoroughbred or high-

grade Angoras, such as will yield merchantable mohair, will not need to consider markets, as the increase will be employed to produce mohair. All does, of course, are kept for breeding with purebred bucks. It will be ascertained that the fleece of low grades is barely worth the cost of clipping it; that the skin is not so valuable for leather as that of the common goat; and that, as a rug or robe, the pelts are not so valuable as those of the higher grades. Therefore, if there is to be any profit from this part of a flock, there must be a market for the meat.

So many questions concerning this phase of the industry have come to the Bureau of Animal Industry that, in collecting data for this paper, it was decided to go beyond the newspaper accounts and ascertain the facts from the actual producers themselves. The question submitted was, "Do you have any difficulty in disposing of your surplus Angoras for meat?" The answers have been invariably in the negative. It should be said, however, that in the Northwest very few are used for meat. They are considered more valuable there as brush destroyers. The conditions obtaining there are not found in all localities where Angoras are raised. In many places Angoras will be kept where, instead of permitting them to destroy the brush utterly, efforts will be made to preserve brush pasture for them; in the Southwest they are not all required for destroying brush, and thousands must be sent to market.

The reason why goats are not seen oftener in the market reports of receipts and shipments is that they pass as sheep. However, increasing numbers are found in the larger markets.

While the goats pass as sheep, they are also sold to consumers as sheep. They have not yet brought as good prices as sheep, and it can not be hoped that they will do so until there is the same demand for their mutton, which will come when the prejudice against goat meat disappears. The difference is very slight in some places. In Kansas City, for instance, sheep bring about one-half a cent a pound more than goats.

LOCALITIES ADAPTED TO ANGORA GOAT RAISING.

CLIMATE.

So far as temperature is concerned, no place has been found that is too hot or too cold for Angoras. Although not partial to heat, they will stand it quite as easily as sheep. Shade is essential to success if the sunshine is very warm.

The climate in Angora, where the breed originated and is still supposed to flourish in its most perfect state, is extreme. A temperature as high as 85° F. is registered in the summer and as low as 0° F. in the winter. In Cape of Good Hope, where they are thriving well, the

temperature goes higher in the summer, but not so low in the winter. The United States presents a wider range of temperature, where, in southern Texas and New Mexico, it may go above 100° F. in the summer, and in Idaho as low as 30° F. below zero in winter.

SOIL.

Almost any kind of soil, except wet and marshy land, is suitable for these goats. Their preference is mountainous or rocky land, where they find it necessary to climb mountain sides and rocky cliffs to browse. Such situations not only afford them satisfaction in climbing and feeding, but the rocks serve to keep the feet trimmed. This is an important matter, for on soils devoid of stones or sand the feet must oftentimes be trimmed by hand.

One of the reasons for the freedom of goats from most diseases is that they require pure water, and in no place is better water found than in the springs and rivulets of hilly or rocky localities. Goats also require much exercise, much more than sheep, and such situations satisfy the inclination.

Lowlands that are wet or marshy are not at all suitable. The effect of such situations soon makes itself apparent in a flock of goats. Foot rot is apt to give endless trouble, and the feet will need much attention in other respects. Therefore lowlands with much moisture and high temperature are not recommended for goat culture. It is a historical fact that the first effort to transplant the Angora goat outside of Asia was a failure on account of these conditions. This was in 1554, when a few individuals were taken to Holland, but they soon died, owing to the moist climate.

However, it must not be understood that rocks and hills are essential, although they provide for the goat an ideal situation. As stated above, almost any kind of soil is suitable except wet and marshy land. Goats are not partial to water in any form—in the soil or in the form of rain, snow, or sleet—and they drink a very small amount. Keep the goats dry overhead and underfoot.

The habits of goats, as set forth in the earlier paragraphs of this paper, suggest at once to the informed person that there are in the United States millions of acres of land suitable for goat culture which are now serving no economic purpose whatever. Much of this would answer for sheep raising, but much more of it is suitable for goats only.

AVAILABLE LAND.

There are many acres of farm land in this country covered with brush which are well adapted to Angora raising. The worn-out farms of New England furnish an excellent field for these animals, and at this time there are many small flocks of from three to fifty goats in



ANGORA GOATS IN NEW ENGLAND IN MIDWINTER.

The animals are healthy and vigorous in spite of their severe climatic environment.



FIG. 1.—ANGORA GOATS IN MONTANA.



FIG. 2.—ANGORA GOATS IN MONTANA.

Corral on mountain side.



ANGORA GOATS IN NEW MEXICO.

This illustration is specially valuable as showing the manner in which goats range and the character of their feed in the Southwest.

that section exterminating the brush and fertilizing the soil. These animals have thrived particularly well and have withstood the cold winters excellently.

In the South, where there is an increasing interest in live stock raising, there are many thousands of acres of rough mountainous land so densely covered with brush as to be of no practical use. Much of it if cleared would provide excellent pasture. Reports have come to this Bureau of a considerable number of Angoras that have been taken into the South and are doing well.

The "stumpage" districts of Michigan and Wisconsin, where there are great areas of land of the best soil covered with brush, would, if cleared, be converted into good pasturage for sheep and cattle. Large flocks of goats have been put upon much of this land and are clearing it, producing mohair, and enriching the soil. The peculiar adaptability of this section for clover and grass makes pasturage perfect.

Angoras have been tried in the Northwest with success. Some of the finest and best goats in the United States are raised in Oregon. In Montana, Washington, and Idaho, where there is an abundance of available land, Angoras have been tried and have proved a successful venture. In Montana the grazing problem is receiving attention, and it is quite probable that the value of grazing land for goats will be considered in other Western States. While goats prefer brush and weeds, they will readily eat grass and thrive on it.

The largest flocks of the country are in the Southwest, principally in Texas and New Mexico. In this section there is a vast area well adapted to the industry. On account of the mildness of the climate, winter housing is unnecessary. The fleece is apt to be lighter in weight than that grown in the North, and perhaps there is no real advantage from an economic standpoint in favor of the Southwest.

The Ozark region is also well adapted for Angoras, and reports indicate that a number of breeders of goats have taken advantage of these favorable conditions.

DISEASES AND OTHER ENEMIES.

Goats are less subject to disease than sheep; but these species are so closely allied that treatment in cases of disease is the same for both. Several accounts have been published in the agricultural press of goats in the Southwest being affected with stomach worms and with grub in the head, the same as sheep are affected in the same localities.

The treatment recommended for the screw worm is as follows: Add to any one of the carbolic sheep dips 10 per cent of chloroform. Apply this mixture, after thoroughly cleaning the wound, with a wad of cotton. The chloroform immediately destroys the larvæ and the carbolic dip prevents the further blowing of the wound.

The stomach worm (*Hæmonchus contortus*)^a is the same form as found in sheep, cattle, and deer. The treatment in all cases is the same as for sheep.

Goats have at least three kinds of scab parasites peculiar to their species, but apparently only two kinds of scab develop. Psoroptic scab of sheep does not develop disease upon them, though it can undoubtedly sustain life for a while.

Tapeworms of the genus *Moniezia* are found in goats. In the intestines are also found five roundworms, namely, *Strongylus filicollis*, *Oesophagostomum venulosum*, *Sclerostoma hypostomum*, *Bunostomum trigonocephalum*, and *Trichocephalus affinis*.

Verminous pneumonia occurs in goats as well as in sheep.

Tuberculosis is rare in goats. Their freedom from this widespread and insidious disease is probably due to the feed and climate where the animals are found and to the exercise and fresh air obtained in roaming over the pastures. When confined in close quarters with cows that have tuberculosis, goats will also contract the disease; in other words, the goat's freedom from tuberculosis is due to environment rather than to a natural immunity.

Goats in good condition are not likely to be diseased or to contract disease, but there are some maladies which affect them if they are permitted to get into poor condition.

Takosis, the disease which has played such havoc in a few flocks during the past few years, seems to have about run its course, and it is now confidently believed that it will soon disappear entirely. The Bureau of Animal Industry took hold of the disease vigorously in 1902, and the advice given and the bulletin published^b have resulted in much benefit to the breeders.

Takosis is probably not of recent origin, for as early as 1876 reports of losses of goats from a disease whose symptoms closely resembled takosis were noted in the Country Gentleman.

The symptoms of takosis are somewhat similar to those accompanying a parasitic invasion of diarrhea and pneumonia. Listlessness and a languid appearance are the first to be noticed, with a slow, feeble pulse and an elevated temperature. Snuffling of the nose and occasional coughing are sometimes observed. The animals become very weak and are easily knocked down. The appetite is capricious, but rumination is seldom impaired. A fluid discharge of bad odor from the bowels is usually observed in the last days of life. The visible mucous membranes are pale and anemic, and respiration is labored and rapid. In no instance has the natural recovery of an animal been seen when once the symptoms of takosis were noted. All affected

^a Information as to this parasite and the treatment is to be found in Circular No. 93 of the Bureau of Animal Industry.

^b Bul. No. 45, Bureau of Animal Industry, "Takosis."

animals should be isolated immediately upon the discovery of the symptoms and a strict quarantine should be maintained as long as the disease remains on the premises.

Good results have been obtained from the administration of 0.10 gram doses of calomel twice a day for two days, followed by powders composed of arsenious acid, 1.40 grams; iron reduced, 12 grams; quinine sulphate, 6 grams, made into twenty powders, giving one to each adult goat morning and evening after the calomel. After an interval of two days this treatment may be repeated.

Goats are apt to have foot rot, but a cure is easily effected by the use of sulphate of copper (blue vitriol). It is usually applied by driving the goats through a trough containing a solution of strong blue vitriol. The solution should be about an inch in depth. Oscar Tom, a breeder of much experience, says:

Butter of antimony applied with a stiff feather will cure it, or mix 1 ounce of sulphuric acid with 2 ounces of vinegar and apply as above. Go over the whole band. Generally one application cures if well done. Change the range at the same time if you can.

It is not a difficult matter, as all goat men agree, to rid goats of lice by dipping them in any of the common sheep-dip preparations. The animals can not thrive to the best advantage when they are carrying a fleece full of lice; sometimes the lice become so numerous as to cause the goat to lose flesh and finally to fail to produce a good quality of mohair, or even to produce a kid, if the infested animal is a doe. Goat raisers must learn that an animal which is badly infested with lice in the winter nearly always requires extra feed; in other words, if lice are raised, they insist on being fed.

The fact that many plants which are poisonous to sheep and cattle may be eaten with impunity by goats is frequently referred to by writers for the press. It is true, however, that goats sometimes die from eating poisonous plants. The so-called "ground ivy" is specially referred to. But it is believed that goats will not eat poisonous plants to an injurious extent unless driven by hunger to do so. Fatalities to goats from eating mountain laurel, previously referred to, are occasionally reported during the early spring months. As soon as other forms of vegetation become sufficiently advanced to afford the animals enough feed, they will refuse to eat the laurel and no more harm is caused by the plant until the coming of another season. Small quantities of laurel may be eaten without ill effect, and it is only when driven by hunger to the consumption of large amounts that any harmful results follow. The use of a drench containing 5 grains of permanganate of potash and 5 grains of aluminum sulphate dissolved in water has given excellent results in cases of laurel poisoning.

The feet should receive some attention from the breeder, as the toes will grow very long and turn up at the points if they are not trimmed. If the goats are run on rocky or very sandy land, it may not be neces-

sary to trim the toes, but if they grow too long they should be pared with a knife.

One of the principal enemies of the Angoras is the wolf. The best guard against wolves is a good wire fence. Sometimes the wolves dig under the fence, and then it becomes necessary to trap them. This is practiced by Mr. H. T. Fuchs, who says:

Three steel traps are fastened to each other, but to nothing else, and catch the wolves. If the trap is made fast, the wolf will break loose, but the weight of three traps fastened together simply tires the wolf out, and it rarely drags them more than 200 or 300 yards.

In many localities the wildcats are especially troublesome. Their prey is the kids.

NUMBER AND VALUE OF GOATS.

IN THE UNITED STATES.

The census reports previous to the year 1900 have not given the number of goats in the United States. The table given herewith is compiled from the Twelfth Census returns and shows the number of goats of all kinds for the year 1900. Besides the exhibit in the table there were 78,353 goats reported for cities and villages, making a grand total of 1,949,605 for the whole country.

It was something of a surprise to find that the total was so large. It is a matter to be regretted that the census returns made no distinction between common goats and Angoras. A free estimate is that about 700,000 of the total are of the Angora breed. The rest are all sorts of animals except recognized breeds of milch goats, of which there are so few as not to affect the total materially.

Number and value of goats, all breeds, on farms in the United States, by States and Territories, in 1900.

State or Territory.	Number of farms reporting.	Number.	Value.
Alabama.....	8,633	117,413	\$94,258
Arizona.....	436	98,403	167,863
Arkansas.....	4,571	51,839	58,788
California.....	1,579	109,021	262,981
Colorado.....	620	37,433	73,141
Connecticut.....	73	313	1,945
Delaware.....	43	143	519
District of Columbia.....	6	9	39
Florida.....	2,154	43,705	32,639
Georgia.....	6,716	84,624	61,972
Hawaii.....	19	653	731
Idaho.....	68	4,481	20,167
Illinois.....	1,642	8,877	19,932
Indiana.....	1,518	4,484	8,920
Indian Territory.....	733	10,529	21,538
Iowa.....	3,007	41,468	146,708
Kansas.....	995	18,288	71,290

NUMBER AND VALUE OF GOATS.

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Number and value of goats, all breeds, on farms in the United States, by States and Territories, in 1900—Continued.

State or Territory.	Number of farms reporting.	Number.	Value.
Kentucky.....	2,144	11,967	\$19,753
Louisiana.....	2,723	38,308	35,667
Maine.....	70	279	1,061
Maryland.....	227	1,179	4,023
Massachusetts.....	145	1,254	7,188
Michigan.....	537	2,861	10,008
Minnesota.....	498	3,821	12,906
Mississippi.....	5,431	55,338	45,594
Missouri.....	2,754	24,487	64,786
Montana.....	61	1,713	7,870
Nebraska.....	488	2,399	9,126
Nevada.....	39	4,633	12,948
New Hampshire.....	61	208	916
New Jersey.....	200	699	3,006
New Mexico.....	2,874	224,136	472,961
New York.....	576	1,316	6,442
North Carolina.....	5,089	42,901	37,967
North Dakota.....	142	1,122	5,308
Ohio.....	1,025	5,432	16,975
Oklahoma.....	277	3,772	10,854
Oregon.....	2,178	109,661	375,229
Pennsylvania.....	763	2,197	8,951
Rhode Island.....	16	23	131
South Carolina.....	3,643	26,576	24,450
South Dakota.....	252	2,915	15,050
Tennessee.....	3,663	25,884	38,938
Texas.....	6,742	627,333	923,777
Utah.....	93	1,427	2,702
Vermont.....	41	102	444
Virginia.....	1,004	5,305	10,002
Washington.....	165	2,876	10,757
West Virginia.....	219	847	2,123
Wisconsin.....	534	3,882	12,760
Wyoming.....	47	2,666	11,884
Total.....	77,534	1,871,252	3,266,080

Previous to 1900 the majority of the Angoras in the United States were located in the Southwest. At the present time they are distributed in every State and Territory. The economic value of goats in clearing brushwood and the value of the annual growth of the fleece have made these little animals a factor in the live-stock industry of the country.

It is probable that, at a conservative estimate, there are about 1,000,000 Angoras in the United States at the present time. This approximate estimate is based upon the quantity of mohair purchased by leading mills, making some allowance for the considerable amount of hair used by firms for which no figures are obtainable.

IN SOUTH AFRICA.

The census returns of Cape Colony for April, 1904, give the number of Angoras as 2,775,927. The very large amount of mohair exported from Cape Colony ports to the United Kingdom in 1904—13,984,345 pounds—would certainly indicate that either the census figures are far below the actual number or that the mohair exported must have come from sections not mentioned in the official reports. In 1904 there were exported from the Orange River District (included in the 13,984,345 pounds to the United Kingdom), 1,484,322 pounds of hair, which would indicate that there were something like a half million goats in that colony. Also, there were exported from Basutoland in 1904 399,577 pounds of mohair (also included in the shipment to the United Kingdom in that year), indicating that there were about 125,000 Angoras in that section, making the number altogether in South Africa in the neighborhood of 3,500,000.

It is evident from the official reports of Cape Colony and of this country that no mohair is exported directly to the United States from the Cape. All of the hair of South Africa brought into this country is purchased in England. Practically all of the mohair grown in South Africa is exported to the United Kingdom.

According to the figures of the Statistical Register of Cape Colony, South Africa, the average price of goats from 1900 to 1904 was about \$5.25.

IN ASIA MINOR.

The number of Angoras in Asia Minor can not be estimated very closely. According to Schreiner, there were 1,230,000 goats in the vilayet, or province, of Angora in 1894. While probably the best and the greater number of goats are in this vilayet, there are a large number in other parts of Asia Minor. In 1904, according to official figures, there were exported to the United Kingdom 10,809,924 pounds of mohair, valued at \$3,377,137, which is at the rate of a fraction over 31 cents a pound; and there was in the same year imported into the United States direct from Turkey \$416,996 worth of mohair, at the rate of 28 cents per pound, which amounts to about 1,489,270 pounds. There is a tariff duty of 12 cents a pound on our imports of mohair; the total value of the Turkish product was, therefore, 40 cents a pound.

The above figures give a total of 12,299,194 pounds of mohair exported from Turkey in 1904 to the United Kingdom and to the United States. An English authority who is familiar with the Angora goat industry in Turkey says that the average weight of the fleeces is under 3 pounds. Let us then suppose it to be 2½ pounds; this would certainly indicate that there were over 4,000,000 Angoras in Asia Minor in 1904.

PRODUCTION AND IMPORTS OF MOHAIR.

PRODUCTION IN THE UNITED STATES.

The quantity of mohair and goat's hair (probably all was mohair) produced in the United States in 1899, as reported by the census of 1900, was 961,363 pounds.

The Bureau of Animal Industry, in collecting data from four leading mills, found that in 1899 they had handled 1,077,000 pounds of the domestic product. Three of these mills used 1,089,550 pounds in 1900 and 1,327,095 pounds in 1901. While it is possible that the mills bought the mohair and held some of it in storage from a previous year, the increased production leads one to believe that all goats raised and mohair produced in 1899 were not reported in the census figures.

The following table is compiled from the census report for 1900, and gives the quantity, value, and price per pound of mohair produced in each State and Territory in 1899. The average price per pound for the whole country was 27.8 cents.

Quantity and value of mohair and goat hair produced in the United States in 1899.

[From reports of the Twelfth Census.]

State.	Quantity.	Value.	Value per pound.	State.	Quantity.	Value.	Value per pound.
	<i>Pounds.</i>				<i>Pounds.</i>		
Alabama.....	469	\$140	\$.298	Nevada.....	10,590	\$3,672	\$.350
Arizona.....	27,030	7,326	.279	New Hampshire.....	30	9	.300
Arkansas.....	1,763	487	.253	New Mexico.....	113,545	29,917	.264
California.....	169,770	45,665	.269	New York.....	383	155	.400
Colorado.....	1,843	550	.298	North Carolina.....	416	97	.230
Connecticut.....	465	177	.380	North Dakota.....	1,220	448	.367
Florida.....	20	8	.400	Ohio.....	469	112	.240
Georgia.....	726	215	.296	Oklahoma.....	693	187	.267
Idaho.....	11,688	3,989	.341	Oregon.....	267,780	74,363	.203
Illinois.....	2,793	751	.270	Pennsylvania.....	720	242	.333
Indiana.....	867	282	.325	Rhode Island.....	10	2	.200
Indian Territory...	760	126	.166	South Carolina.....	73	26	.356
Iowa.....	28,080	8,607	.306	South Dakota.....	1,693	683	.403
Kansas.....	4,066	1,077	.265	Tennessee.....	1,486	438	.290
Kentucky.....	524	163	.310	Texas.....	274,810	77,478	.282
Louisiana.....	385	92	.238	Utah.....	459	142	.310
Maine.....	105	21	.200	Vermont.....	5	2	.400
Massachusetts.....	1,120	396	.353	Virginia.....	343	113	.330
Michigan.....	1,833	419	.228	Washington.....	4,000	1,097	.274
Minnesota.....	556	180	.323	West Virginia.....	140	43	.307
Mississippi.....	268	84	.317	Wisconsin.....	514	145	.282
Missouri.....	10,203	2,798	.274	Wyoming.....	8,100	2,412	.297
Montana.....	2,750	824	.300				
Nebraska.....	5,801	1,725	.300	Total.....	961,364	267,875	.278

QUANTITY OF DOMESTIC AND FOREIGN MOHAIR USED IN THE UNITED STATES.

The following table gives the quantity of domestic and foreign mohair consumed by leading manufacturers. It has not been possible to obtain the amount used by other mills, which must certainly be considerable.

Quantity of domestic and foreign mohair used in the United States by leading mills, 1900 to 1905.

DOMESTIC.

	1900.	1901.	1902.	1903.	1904.	1905.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Sanford Mills.....	648,025	721,796	704,759	761,215	643,781	980,004
Massachusetts Mohair Plush Company.....	425,000	600,000	620,000	680,000	720,000	305,000
Cranston Worsted Mills ^a	16,525	5,299	60,000	85,000	72,000	27,600
Queensbury Mills.....	20,160	15,717	160,488	288,843	208,710	240,571
Tingue Manufacturing Company.....		144,270	155,718	78,808	120,763	333,800
Total.....	1,109,710	1,487,082	1,700,965	1,893,866	1,765,254	1,886,975

FOREIGN.

	1900.	1901.	1902.	1903.	1904.	1905.
Sanford Mills.....	293,559	107,537	333,367	740,346	462,638	421,982
Massachusetts Mohair Plush Company.....	75,000	75,000	210,000	220,000	280,000	506,000
Cranston Worsted Mills.....	916	600				
Queensbury Mills.....	13,440	10,478	106,993	152,562	139,139	246,953
Total.....	382,915	193,615	650,260	1,112,908	881,777	1,174,935
Total for domestic and foreign.....	1,492,625	1,680,697	2,351,325	3,006,774	2,647,031	3,061,910

^a Eighty thousand pounds of Turkish mohair is included in the amounts of hair used in 1902, 1903 and 1904.

IMPORTS OF MOHAIR AND ANGORA GOATSKINS.

Occasionally fears have been expressed that the development of the Angora goat industry would soon result in an oversupply of mohair and thus a consequent check to goat raising. The importations for the last five years indicate that the demands of this country for mohair are far in excess of the production. Note the situation as shown in the following table, which gives the imports of "hair of the Angora goat, alpaca, and other like animals," as shown by reports of the Treasury Department and the Department of Commerce and Labor:

Imports of goat hair for the fiscal years 1901 to 1905.

Fiscal year.	Quantity.	Value.	Value per pound.
	<i>Pounds.</i>		
1901.....	739,419	\$238,459	\$0.322
1902.....	793,649	233,275	.294
1903.....	1,243,749	409,727	.329
1904.....	2,231,340	643,850	.289
1905.....	2,625,575	749,764	.285

The official reports do not give the figures for mohair and alpaca hair separately, but it is not believed that the amount of imports of the latter is large.

It should be remembered that the value of imported mohair is fixed at the ports of export. To arrive at its value here there should be added the expense of shipping and the duty of 12 cents per pound.

The following table gives the quantity and value of imports of Angora goatskins for the years 1903, 1904, and 1905. Previous to 1903 the official reports did not separate the Angora skins from other goatskins imported into the United States.

Imports of Angora goatskins into the United States for the fiscal years 1903, 1904, and 1905.

[Bureau of Statistics, Department of Commerce and Labor.]

Year.	Quantity.	Value.
	<i>Pounds.</i>	
1903.....	148,940	\$23,940
1904.....	17,846	3,231
1905.....	43,450	6,661

IMPORTS OF MOHAIR INTO THE UNITED STATES FROM TURKEY.

The following figures give the value of mohair imported into the United States from Turkey for the years 1901 to 1904. It will be noticed that there was an increase of \$168,447.36 worth of hair imported in 1904 over the amount imported in 1903, and also that the amount imported in 1904 was six times as great as that imported in 1901.

Mohair declared for export from Turkey to the United States, 1901 to 1904.^a

[From annual reports of merchandise declared for export to the United States.]

Year ending June 30—	From Constantinople.	From Bagdad.	Total reported.
1901.....	\$68,794.56	\$542.67	\$69,337.23
1902.....	95,399.41	7,994.40	103,393.81
1903.....	241,620.22	6,928.42	248,548.64
1904.....	416,996.00	(^b)	416,996.00

^a No report from Constantinople for 1905 is available as yet. No exports of mohair to the United States are reported from any consular district in Turkey, other than the two mentioned, for any of the years covered by the above statement.

^b The United States consul at Bagdad reported no exports of mohair from that consular district to the United States during the year ending June 30, 1905.

IMPORTS OF MOHAIR INTO THE UNITED KINGDOM.

It is plainly seen by the table following that an enormous quantity of mohair is imported annually from Turkey and South Africa into the United Kingdom, from which center of the mohair trade Germany, France, Holland, Belgium, and our own country are purchasers.

Imports of mohair into the United Kingdom from British South Africa and Turkey, 1901 to 1905.

Year.	British South Africa.		Turkey.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	<i>Pounds.</i>		<i>Pounds.</i>		<i>Pounds.</i>	
1901.....	10,615,948	\$3,345,840	9,102,352	\$3,032,204	19,718,300	\$6,378,044
1902.....	18,241,579	5,288,090	11,518,629	3,634,390	29,760,208	8,922,480
1903.....	15,755,572	4,752,132	12,131,343	3,866,653	27,886,915	8,618,785
1904.....	13,984,345	4,327,457	10,809,928	3,377,137	24,794,273	7,704,594
1905.....	12,532,482	3,795,709	12,524,356	3,931,650	25,056,838	7,727,359

Judging from the official figures of the United Kingdom the Turkish mohair brings a slightly higher price than the South African hair. This statement is corroborated by Mr. S. B. Hollings, an authority on the mohair trade of the world. From 1901 to 1905 the difference in price per pound was a little less than 2 cents, in favor of the Turkish hair.

TARIFF DUTY ON IMPORTS OF MOHAIR INTO THE UNITED STATES.

The act approved July 24, 1897, places a duty of 12 cents a pound upon mohair. Mohair cloth for buttons is taxed 10 per cent ad valorem. The duty on dressed and finished goatskins is 20 per cent ad valorem; on skins for morocco, tanned but unfinished, 10 per cent ad valorem. These rates are subject to increase under certain conditions of shipments.

ANGORA GOATS AT THE LOUISIANA PURCHASE EXPOSITION.

The exhibit of Angora goats at the Louisiana Purchase Exposition (1904) was the largest, in point of numbers, ever held, and a large number of most excellent animals were brought together there. Mr. George F. Thompson was the juror for goats, and his official report is given herewith:

Angora goats were given a place in the live-stock exhibit of the Louisiana Purchase Exposition on the same basis that other domestic animals were exhibited. This was most gratifying to those who are specially interested in the substantial growth of this new industry in the United States. It was a recognition well deserved, and at the same time one of the many evidences of the broad-minded character of the management of the exposition.

Previous to this showing of Angoras at St. Louis, which was designed to be international in character, there had been held at Kansas City four annual exhibits under the direction of the American Angora Goat Breeders' Association. The goat breeders had attended these several annual shows at much expense, in order that they might derive from the comparison and competition there afforded the points necessary for the improvement of their animals. That they learned their lessons well and rapidly was exemplified by the presence in the ring each year of animals much superior to those shown the year before, a situation due to two causes—to better judgment in selecting breeding animals and to better breeding, so far as it could be brought into evidence in the short time.

The information gained at those exhibitions was utilized to the fullest extent by the goat men in the breeding, selection, and preparation of their animals for the test at St. Louis. So it came about that the exhibit of Angoras at the Louisiana Purchase Exposition, not only in numbers, but in quality, exceeded any other exhibit that was ever held. The animals shown, with very few exceptions, were such as would rank with the prize winners at the previous exhibitions. There were no animals shown here with such outstanding merit as to surpass, to any considerable extent at least, the champions of some of the previous exhibits. Indeed, there is a question in the mind of the juror whether there had not been one or two previous champions which surpassed those shown at St. Louis. But the lot, considered together, was of exceptionally high quality and extremely satisfactory to those who are fostering the industry. The fact that there were so many animals of high merit made the work of the juror a difficult task. It seems to be appropriate in this connection, however, to state that the juror on goats at St. Louis had served with others in a like capacity at Kansas City at three of the previous annual exhibitions, where most of the breeders had met him and who knew his opinions; thus the breeders knew in a general way the ideal that was in the mind of the juror.

There went before the juror for examination (and reexamination for championship awards) 345 Angoras. Few people who are not breeders of these animals realize how much work the judging of this number required. A most careful examination must always be made of the fleece with reference to its density, luster, length, oiliness, freedom from kemp, etc.; it is impossible to do justice to a goat without such painstaking efforts. These conditions are hidden from the eye of the casual observer, and they explain why the juror's selection of prize winners did not in all cases agree with the judgment of some spectators.

The announcement was made by Col. Charles F. Mills, chief of the department of live stock, to the jurors on sheep and goats that the management of the Louisiana Purchase Exposition selected the jurors because of their special fitness to do the work in hand, and for this reason they were not in any sense bound by any former recognized standard or score card; that they were to award the premiums to those animals which best represented the purpose for which the breed is raised; in other words, they were to consider only the lessons learned from the past and to anticipate the future by fixing the type for which all breeders should aim. This was not so difficult with the Angoras as with sheep and other domestic animals, for the best Angora is yet far from being the ideal animal. It was not a difficult matter to know what was desired in the goat and how far the animals on exhibition fell short in desirable characteristics. The judging of the Angoras, therefore, was along the same lines that had been followed at the previous exhibitions at Kansas City.

BREEDERS' ASSOCIATIONS.

REGISTRATIONS IN THE AMERICAN ANGORA GOAT BREEDERS' ASSOCIATION.

Mr. John W. Fulton, secretary of the American Angora Goat Breeders' Association, furnishes the following facts regarding the association:

The American Angora Goat Breeders' Association now has a membership of 500 breeders of Angora goats, representing nearly every State. The pedigree records show 57,500 animals recorded, the registrations during 1905 being 3,036 and for the first seven months of 1906 2,477 animals. Though the number of registrations during the last two years shows a slight decrease over previous years, this decrease does not indicate a loss of interest on the part of the breeders, but it is rather an indication that better animals are being selected for registration.

The headquarters of the association are at Kansas City, Mo., where it holds a competitive exhibit of Angora goats annually, in October. The association liberally supports other Angora goat exhibits throughout the country and is doing much to develop this industry.

SOUTH AFRICAN ANGORA GOAT BREEDERS' ASSOCIATION.

Mr. G. A. Hoerle, who made two visits to South Africa in the interest of the Angora goat industry, and who made one large importation (previously mentioned) of excellent animals from that country, gives the following data regarding the South African Angora Goat Breeders' Association:

In South Africa the breeders of goats judge their animals upon points which are different from our judging, and have bred in a different direction from our breeders, both of which matters I fully indorse except as to the matter of general shape and symmetry. They do not like a long body and short legs so well as we do in the United States, and their goats would appear to many of our breeders as more or less leggy. Though their registry regulations do not mention any point for foretop, mohair specks around the eyes, and mohair on all the legs and on the ears, which a good register should recognize, the best animals show more or less of these fancy points. Most prized of all is the mohair tail, as it usually indicates denser covering along the back; then mohair legs, especially the front legs, which become covered two or three generations later than the hind legs; then mohair foretops, mohair specks, and, last, mohair on the ears.

That a mohair foretop is not so very much valued in the colony, we may judge from the fact that the sweepstakes champion at the Port Elizabeth show in 1899, a yearling buck, bred by R. C. Holmes, was perfectly bare on the face. Yet A. B. Hobson, the winner of the championships for both 1903 and 1904, liked the style of the mohair of this buck so much that he bought him for a high figure and afterwards refused \$550 for him. On the other hand, many of the South African Angoras have hair enough on their faces to satisfy even the most fastidious American taste.

The South African register requires a minimum length of fleece of 12 inches a year. Only goats of finest hair and greatest density of covering are accepted, and these usually have shorter hair than that of the coarser-haired animals.

The South African register is, no doubt, an admirably arranged institution, although for practical purposes in the United States it would not do in its present shape. It takes three examinations to pass a goat into the register—one as a yearling, one as a 2-year-old, and one as a 3-year-old. Each examination is very expensive (\$5 per day and all traveling expenses, and these latter are very high in the colony). This high cost of having goats registered has kept many breeders out of the association.

In March, 1904, the beginning of the eighth year of the register, there were only about 350 living Angoras of both sexes which had passed three examinations, and from 1,200 to 1,400 which had passed either the first alone or both the first and second examinations. The great stumbling block is usually the required fineness of fiber. This usually degenerates so fast in the alkiline districts of the colony that no sweepstakes champion has been able to be registered. It must be evident that registered goats are rarely sold, and, if they are sold, they are goats which always cost three figures in pounds sterling.

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